

AMERICAN ARTISAN

APRIL, 1948

68th Year

RESIDENTIAL AIR CONDITIONING • WARM AIR HEATING • SHEET METAL CONTRACTING

In This Issue

potential markets are vital to future sales. Teen-agers will buy your products tomorrow. See Page 72 to plan for your share of this market.

yearly inventory can be a major upheaval in your business routine. "Inventory Simplified" keeps the information at your fingertips.—Page 78.

search on the insulation of floor panels has added to the efficiency of such systems. Insulation of a concrete slab is discussed on Page 90.

very grave problem in fume removal was solved by the unusual installation described on Page 99.

The Cover Picture

Unless steel sheets be sheared in a heavy precision shear at Blick's, Weehawken, N. J. on Page 103.



The **NEW**

Another Lamneck **FIRST**

Simplenic **SYSTEM**

for **LOW COST, SIMPLIFIED, FAST**
installation of Forced Air
Furnace Pipe and Fittings
ONE COMPLETE SYSTEM



ECONOMICAL and EFFICIENT

- New fast self-locking joints.
- Complete system for every installation.
- Cuts layout and installation time.
- Only four duct fittings required.

Again Lamneck introduces a major design advance in the field of forced air heating — a worthy companion line to the great Lamneck "700" Deluxe Forced Air Series! The new Lamneck SIMPLENIC System will meet the needs of every heating contractor for a low cost, simplified, efficient, complete installation system! As ever, you can "Look to Lamneck — for the First and the Finest!"

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WRITE FOR NEW

Simplenic

**DESCRIPTIVE
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and name of
your nearest
JOBBER



Lamneck

**FURNACE PIPE
AND FITTINGS**

NEXT TO REFRIGERATION..

Evaporative Kooler-aire

is Best

COOLS • WASHES • CLEANS AND FILTERS 100% FRESH AIR

● If you have customers who can afford refrigerated air conditioning, by all means sell it to them. Sell them usAIRco Refrigerated Kooler-aire.

But there are hundreds in your own territory who can't afford refrigeration. Your own experience will substantiate this.

Yet these people desperately need Comfort Cooling. They need the crowd-pulling, customer-satisfying, climate of comfort cooling . . . to compete . . . to stay in business . . . to make a profit.

And you can use the extra volume and extra profit that small business is ready to place with a firm that can supply comfort cooling at a price they can afford.

Evaporative Kooler-aire is their dish . . . and your meat. And you should investigate

it now . . . find out how superior the 1948 models really are . . . how these pre-engineered packaged systems can be quickly and economically installed to give small theaters, super-markets, restaurants, bowling alleys, retail shops, stores and professional offices, comfort cooling they can afford to own and to operate.

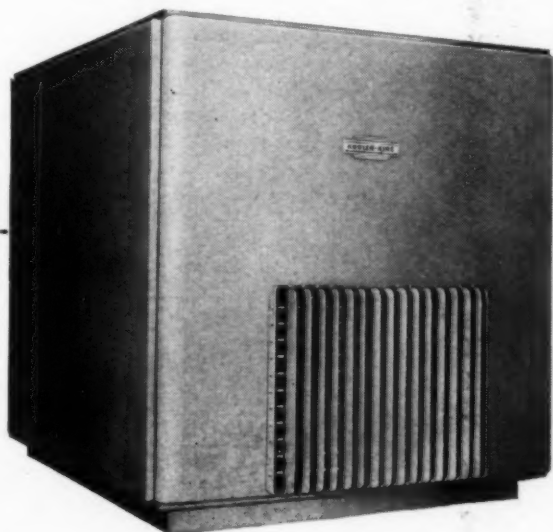
Write Today for Dealer Details

See how Evaporative Kooler-aire fits into your selling program. How it enables you to cash in on sales that you might never make. Evaporative Kooler-aire does the job at lower costs . . . but with the same profit for you.

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I want to round out my line. Send me details on the 1948 Evaporative Kooler-aire Program.

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ADDRESS _____
TOWN _____ STATE _____

AMERICAN ARTISAN

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RESIDENTIAL
AIR CONDITIONING
WARM AIR HEATING
SHEET METAL CONTRACTING

Merged with American Artisan are "Warm Air Heating" and "Furnaces and Sheet Metals"

MANAGEMENT SECTION

EDITORIAL—LABOR MANAGEMENT RELATIONS ACT	69
KRUCKMAN—CLASH OF IDEOLOGIES	70
CULTIVATE TOMORROW'S CUSTOMERS	72
CREDITS & COLLECTIONS	73
INVENTORY SIMPLIFIED	75
NEWS SUMMARY OF THE MONTH	76

RESIDENTIAL AIR CONDITIONING SECTION

HEATING THE SMALL HOME	81
HEATING A HANGAR WITH WARM AIR	84
CORRECT PRACTICE IN LP GAS HEATING (II)	85
NEUBECKER—TRANSITIONAL CURVED ELBOW	88
CONCRETE FLOORS ON GROUND	90
WOOD & RELATIVE HUMIDITY (II)	92
ATTIC FAN FUNDAMENTALS	95

SHEET METAL SECTION

VENTILATION FOR METAL FINISHING	99
SHOWMANSHIP IN STAINLESS STEEL	103
DESIGN OF WASTE REMOVAL SYSTEMS (VII)	106
TOOLS AND THEIR USES (IX)	109

DEPARTMENTS

THE EDITOR'S NOTEBOOK	6
ASSOCIATION ACTIVITIES	115
CONVENTION REPORTS	
MICHIGAN ASSOCIATION	116
CLEVELAND ASSOCIATION	118
EQUIPMENT DEVELOPMENTS	121
NEW LITERATURE	146
WITH THE MANUFACTURERS	154

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APRIL, 1948

Volume 117, No. 4

AMERICAN ARTISAN, April, 1948

The Reason



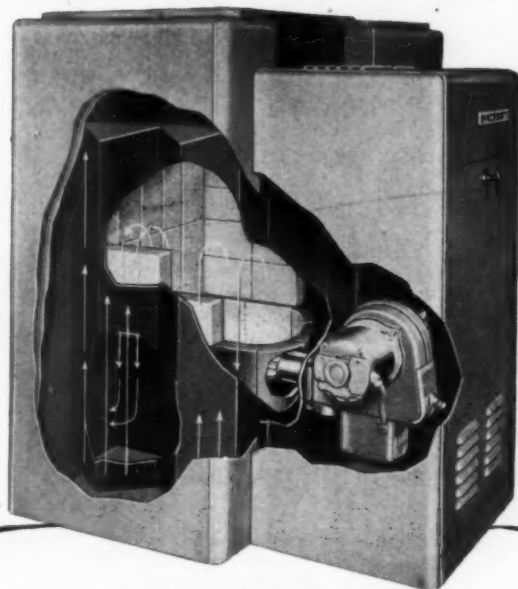
SYNCROMATIC

WARM-AIR FURNACES FOR COAL
OIL AND GAS *Can't be Equaled*



GAS-FIRED

*Beauty... Simplicity
Economy...
Efficiency*



OIL-FIRED SECTION
Showing COUNTER FLOW Principle



COAL-FIRED

*An Engineering Design
Only Syncromatic
Can Offer*

Syncromatic Corporation
WATERTOWN, WISCONSIN

The Editor's NOTE BOOK

Still Coming In

Will you please send me a dozen reprints of the cartoon entitled *Its Getting Along About That Time of Year?*

WALTER SMITH
Niagara Falls, New York.

We are enclosing a page from your magazine which we would very much desire to use as spring advertising. We would like to know if it would be possible to obtain from you or others, the necessary mats from which we can print.

G. P. BUCK, JR.
Washington, Pennsylvania.

I would like to get a large copy of the cartoon published in the December issue of *AMERICAN ARTISAN*, approximately 16 by 22 in. Please advise the price. I would also like to have a dozen regular size reprints.

W. R. SHARPE
Covington, Kentucky.

Enclosed is our check for \$1.50 in payment for 100 reprints of "Ding's" cartoon as quoted in *THE EDITOR'S NOTE-BOOK* in the last issue (February).

M. L. BAKER
Freeport Heating & Appliance Company
Freeport, Illinois.

Please send us 25 copies of "Ding's" cartoon which appeared in the December issue of *AMERICAN ARTISAN*, page 84.

W. C. HOWARD
B. B. Howard Sheet Metal & Roofing Company
Ada, Oklahoma.

The above letters are representative of the geographical distribution of the inquiries and orders received



Note How Simple it is to Set the Range Adjustment on a Mercoid Control

One outstanding feature about Mercoid Controls is the ease in making operating adjustments.

You simply use your fingers—no tools whatever are needed. On either the Type M-41 Furnace Limit Control or the Type M-43 Furnace Fan Control, the adjustment mechanism is alike. You press the small knob in center of the cover and turn it left for the desired low setting, then pull the knob and turn it to the right for the desired high setting as indicated in plain view on the calibrated dial. That's all there is to it—done in a matter of seconds.

This is only one of the many other features you'll like about Mercoid Controls.

We will be glad to send you a Mercoid catalog upon request.

THE MERCROID CORPORATION
4201 BELMONT AVE., CHICAGO 41, ILL.



The Editor's NOTE BOOK

about this popular cartoon. Requests for reprints have ranged from the nominal quantity offered in these columns for the asking to orders for 5000 copies.

Immediately after the December issue was mailed, response was spontaneous. We congratulate Roger Keith, heating contractor of Des Moines, Iowa, who with J. N. "Ding" Darling initiated this idea of spreading the business the year around. The idea looked like a good one editorially, especially because the writer—as a warm air heating and sheet metal contractor—actually lived in recent years with the conditions portrayed.

It looks like our industry could use the media of the cartoon in its public relations, for this cartoon brought home to the people of Des Moines, an annual problem that will beset us in the future just as surely as there is a sunrise.

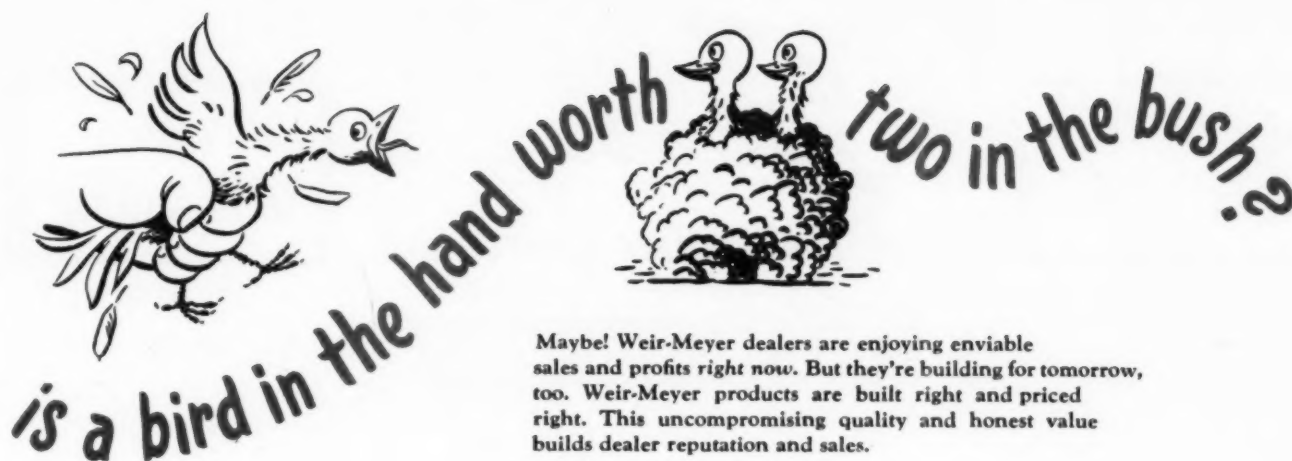
Does anyone have any ideas?—ED.

Humidity

Although the maintenance of proper humidity has been somewhat oversold in the past the importance of this feature of warm air heating should not be overlooked.

Wood & Relative Humidity, a series written by W. LeRoy Neubrech of the New York State College of Forestry, which began in the last issue of *AMERICAN ARTISAN* discusses the effect of the lack of humidity on the wood and furnishings in houses. It takes little imagination to realize how its lack also affects the respiratory system.

The second article of the series is in this issue.



Maybe! Weir-Meyer dealers are enjoying enviable sales and profits right now. But they're building for tomorrow, too. Weir-Meyer products are built right and priced right. This uncompromising quality and honest value builds dealer reputation and sales.

the right heating equipment for all fuels

Some sections today can't install gas-burning equipment; in others oil is short. But conditions change rapidly. That's why wise dealers offer proven, high quality equipment for every fuel. Weir-Meyer dealers especially have a complete, dependable line to sell—all from one reliable manufacturer — with exclusive features that buyers want.



Weir-Meyer dealers get the cream



80 years experience shows that a Weir-Meyer franchise can be a dealer's most valuable asset! It assures fine equipment, backed by consistent sales support. If you're not selling Weir-Meyer, write for franchise facts. You may be in "open" territory.

THE MEYER FURNACE COMPANY - GENERAL OFFICES  **PEORIA 2, ILLINOIS**



Gas-fired Hi-boy



Gas-fired Air Conditioner



Gas-fired Gravity



Oil-fired Hi-boy



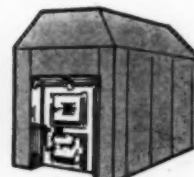
Oil-fired Air Conditioner



Weir Steel Furnace



Coal-fired Air Conditioner



Industrial & Commercial Heating Equipment

MANUFACTURERS OF WEIR & MEYER FURNACES

AIR CONDITIONERS FOR GAS · OIL · COAL · FACTORIES: PEORIA AND PERU, ILLINOIS

The Editor's NOTE BOOK

Aluminum Reference

There is a reference on page 106 in February to a manufacturer's recent publication which gives the preferred aluminum alloys for a long list of products.

Would you please give us the name of this manufacturer so we may write for a copy of this publication?

T. J. PURCELL

The J. E. Daly Company
Wallingford, Connecticut.

A number of readers have asked about this publication and for the names of manufacturers who make the aluminum products illustrated in R. C. Nason's article: *Aluminum . . . Its Architectural Adaptability*.

It is a pleasure to comply with these requests—and they help us because they are a measure of reader interest in an article.—ED.

Grease Filters

Can you advise where I can purchase steel cleanable filters for use in restaurant canopies and hoods?

I formerly purchased this type of filter from a concern that discontinued business the first of this year.

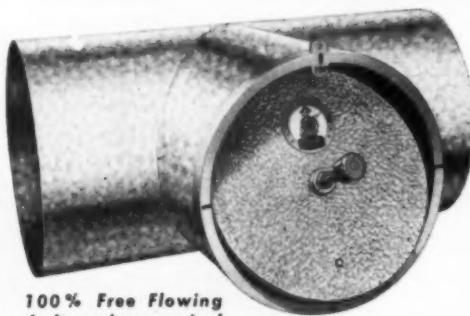
HAROLD OFENLOCH
Quality Sheet Metal Works
Winona, Minnesota.

One of the manufacturers listed in our letter to this reader recently developed a filter equipped with a cone-shaped cup which catches the grease from the range hood. It will be illustrated and described in the EQUIPMENT DEVELOPMENTS department.—ED.

Sentry-

FUEL AND HEAT CONTROLS

SENTRY DRAFT REGULATORS



100% Free Flowing
draft—when required

All unnecessary working parts have been eliminated in this new economical and efficient draft control. Baffle plate and mounting ring are of durable light weight aluminum—bearings and pivots of non-corrosive brass. This permits free, automatic operating action and feather-light sensitivity to the slightest air currents at all times—as well as assurance of long life. Pre-setting balance is carefully factory adjusted. Sentry regulators are available in sizes from 4" through 10" in diameter for horizontal or vertical pipe installations.

AT-A-GLANCE TANK GAUGES

The outstanding gauge in the field, it was chosen for nearly 50% of the installations made in 1945-46. Clear visibility with accurate, easy reading from all directions is only one of its many features. In addition, simplified mechanism eliminates intricate working parts such as gears, cams, springs or magnets which often cause trouble and wear out. Fully approved and listed as standard by the Underwriters' Laboratories, Sentry at-a-glance gauges are durably built, guaranteed leak-proof and will withstand filling pressure of more than 50 lbs. per sq. inch. Installation is quick and easy—even when a tank is partially filled. Sentry gauges are factory designed and constructed to fit all tank sizes and shapes, including barrels and drums.



Write for fully
illustrated brochure.



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GREEN BAY • WISCONSIN

The Editor's NOTE BOOK

The Forgotten Man

In my opinion, another especially dangerous factor in the current economic scene is the growing disparity between prices of various products and among the current incomes of various groups of the population.



Upon many groups of consumers the impact of rising taxes and of rising costs of living has been terrific. Steadily, large numbers of our consuming families have had their disposable income cut by taxes. And taxes are a kind of first mortgage, for they must be paid in full, however high living costs may climb.

Furthermore, the principal cost of living increases have hit us right in the stomach. Food costs simply cannot be sharply reduced by the normal family. You can make old shoes and old clothing do for a while if prices look too high. But you must eat.


Despite the wide-spread increases in current earnings, despite the large number of individuals who have climbed to higher income levels, it is not at all unlikely that, for the great masses of people, the area in which discretionary spending can be exercised for the purchase of goods other than indispensable necessities has actually narrowed.


The forgotten man of the nineteen forties is the unorganized worker—the salaried man, the doctor, the lawyer, the teacher, the civil servant, the clerk, the free lance writer, the pensioner, the small shareholder, yes even the middle-bracket executive.—G. ROWLAND COLLINS, in the *Tax Outlook*.

One man and a Lockformer  can make more Pittsburgh

Locks  than sixteen men with 8 brakes. 

Equipped with extended shafts for mounting Auxiliary


Rolls  Lockformers also make a variety of other

seams  with similar speed . . . and, when

equipped with the Power Flanger Attachment 

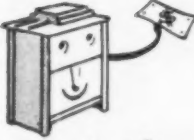
make Flanges on either straight or curved pieces.

 This tremendous savings in seaming time cuts over-

all fabrication costs  in half! That's why even the

smallest shops  find a Lockformer an exceedingly

profitable investment  . . . why many

a Lockformer has "paid" for itself  out of

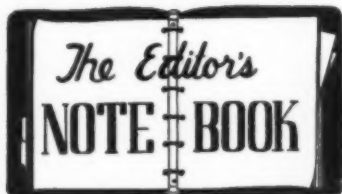
savings made on a single job! . . . and that's why

there are over 12,000 Lockformers in use today!

We'll be glad to send you complete information; just

address the LOCKFORMER COMPANY  at

4615 Arthington Street, Chicago 44,  Illinois.



Farm Ventilation and Heating

Agricultural specialists point out that ventilation is a vital factor in successful farming.

Fact is that both ventilation and heating make an important contribution to the success of a farm.

A reader tells us an oil-fired winter air conditioning unit installed in a hog house decreased mortality rate immediately after the farrowing pens dried out. Pigs per litter increased from six to eight.

Construction Performance

Figures showing that the construction industry is doing a better job for its customers than the general public realizes have come up from several sources.

Analysis of Bureau of Labor Statistics reports reveals that the average cost of new one-family houses (excluding cost of land, architectural fees, and sales costs) is \$6,700. Twenty per cent cost \$3,250 or less, and 14 per cent, \$9,250 or over.

These figures seem to refute the claim that the industry has been building houses for only the upper income bracket families.

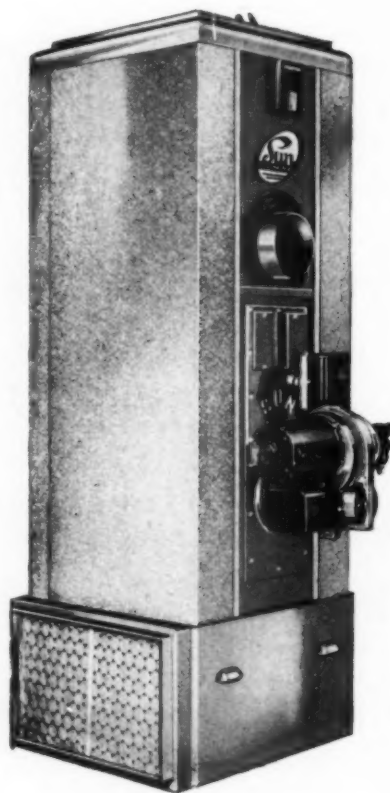
Air Filtering Improves Output

Heating and sheet metal contractors sell and install services and equipment that can make its contribution to industry's efforts to raise employee morale and output.

For example, a Baltimore company found that an air filter system not only increased productivity but improved the quality of castings. The reason for better castings was that when the air was changed every 3½ minutes it



OIL
BURNING
FURNACES



HI-BOY FURNACE

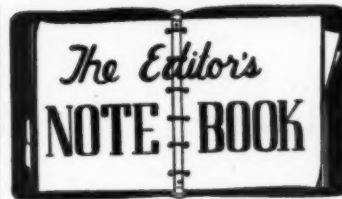
COMPACT—30" wide x 27" x 75" (plus Burner depth)
Two Sizes—85,000 & 100,000 B.t.u. Kres-Kno or Fuel-Master Gun Burners. Also built counter-flo with top mounted down discharge blowers for floor panel heating! Upper section of furnace is a Gravity Oil Furnace.

We build five sizes of counter-flo basement type units.

Write —

J. V. PATTEN COMPANY

Sycamore, Illinois



lowered humidity, with the result that sweat no longer dripped into the moulds where molten metal was poured.

A Pennsylvania plant found fluorescent lighting, air conditioning, and first aid facilities bolstered employee well being. Getting dust out of the air improved health, increased output, and increased earnings.

Refreshments at Work

Workers at a Chicago sheet metal plant agree that their employer is the world's most considerate boss. One of his more recent efforts in their behalf is the installation of a refreshment counter where workers may help themselves anytime they feel like—on the house.

The manufacturer believes the counter easily pays for itself in increased production and concludes: "If they keep stepping up production as they have since we put this refreshment stand in, I'll give them anything they want."

Potatoes and Pollution

From the state of Maine we learn of a recent statute enacted to provide for a penalty for dumping potatoes in Maine's streams—to prevent pollution.

As you know, Maine is a potatoe producing state and it seems so many potatoes have been dumped into the streams that they became polluted. Evidently this situation resulted from the government's potatoe support program.

As you may expect, the statute prohibits, among others, the Federal Government from using Maine's streams as a potatoe dump.

The **MASTER BLOWERTROL** -the *NEW* Thermo-Electric Blower Control for Forced Air Heating & Summer Cooling.

Continuous blower operation throughout the heating season is permitted by *Blowertrol*.

Air Moves at speeds all the way from full blower capacity down to an almost imperceptible zephyr.

Smooth and Silent Changes in velocity are accomplished by altering the blower speed in response to changes in plenum temperature.

Cool Air is never permitted to circulate during the heating season except at extremely low velocity.

Clears Ducts of Cool Air before sufficient velocity is achieved to cause drafts in rooms.

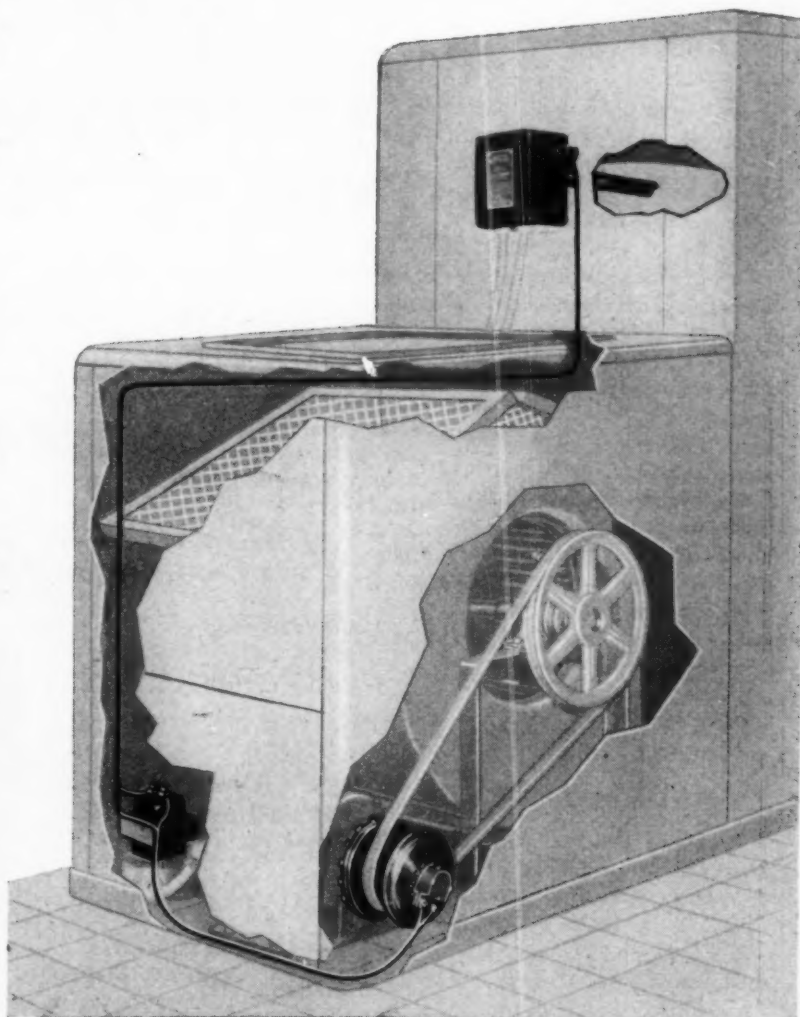
For Summer Cooling Blowertrol will operate blower continuously at full speed by just pushing a button.

Constant Temperature—Maintenance of constant room temperature is greatly facilitated by *Blowertrol*.

No Cold Zones—*Blowertrol* avoids cold zones and uncomfortable drafts due to improper warm air circulation.

In Mild Weather when little or no heat is required, *Blowertrol* automatically turns the blower motor off completely.

High Limit Switch provided with *Blowertrol* may be set to shut down the burner at the desired high limit temperature.



Patent No. 2322405. Other Patents Applied for. Also licensed under Patent 1885048.

The **MASTER BLOWERTROL**

provides a degree of comfort and general user satisfaction far beyond the capabilities of any conventionally controlled forced air heating system. Yet notwithstanding its truly marvelous performance, its cost is still well within the means of the modest small home owner.

Full Information Sent Upon Request

Produced by the mfrs. of **MASTER THERMOSTATIC CONTROLS**—for over a quarter of a Century the Standard of the Industry.

WHITE MANUFACTURING CO.
2362 University Avenue
St. Paul 4, Minnesota

The Editor's NOTE BOOK

Warm Air Manuals

We would appreciate it greatly if you would advise where we can obtain a standard estimate form for use in designing warm air heating, both gravity and forced air.

M. M. FREMONT

B. O. Daubert, Incorporated
Lewisburg, Pennsylvania.

The National Warm Air Heating and Air Conditioning Association publishes manuals covering all phases of the design and installation of both gravity and forced warm air heating. In addition, work sheets are available to facilitate the calculations involved.

A complete list of the manuals and work sheets may be obtained by addressing the association at 145 Public Square, Cleveland 14, Ohio.—ED.

Reader Asks About L P Gas

Enclosed is a request for two pamphlets described in the NEW LITERATURE column.

Also, we wish to gather some facts about the cost of operation using L P Gas as a fuel. Can you give us any information on a house now in operation in this territory?

ALEX KURMES

Alex Kurmes Company
West Orange, New Jersey.

There are many distributors of this fuel throughout the country and a telephone call to local oil companies will disclose the names of several who are selling L P Gas as a heating fuel. This would present the opportunity to make local comparisons and at the same time discuss the local supply. The ratio of mixing propane and butane varies in different



VITROLINER TYPE "E" FLUE!

Attention ARCHITECTS,
CONTRACTORS and BUILDERS

This famous time tested Flue is now available individually—complete in a package made to fit each building or in quantity of 1 to 10,000.

Underwriters listed for all Fuels, ideal for oil or gas—proven practical and successful in thousands of buildings—and used extensively in F.H.A. construction.

Also used industrially where masonry construction would be impractical.

Features—

- ECONOMICAL IN PRICE
- PROVEN THRU 10 YEARS OF SERVICE
- LIGHT WEIGHT AND QUALITY BUILT OF VITREOUS ENAMELED STEEL
- INSTALLED IN 2 HOURS



Write today for details.

Dept. A-1

CONDENSATION ENGINEERING CORPORATION
122 South Michigan Avenue, • Chicago 3, Illinois
MFRS. OF VITREOUS ENAMELED PIPE FOR 20 YEARS



The Editor's NOTE BOOK

sections depending upon climatic conditions. Also, prices vary considerably, depending upon the supply of all fuels in a locality.

However, contractors should not overlook L P Gas as a source of fuel for automatic heating sales. L P Gas designed equipment is being shipped from factories and this new fuel is meeting some of the demand for automatic heating.

Anticipating this interest, several months ago AMERICAN ARTISAN initiated its editorial coverage of L P Gas.

Last month Kenneth R. D. Wolfe, vice president of Fisher Governor Company, Marshalltown, Iowa, started a series which will discuss all phases of liquefied petroleum. Mr. Wolfe's years of contact with this division of the petroleum industry qualify him to discuss authoritatively the problems warm air heating contractors will encounter as they become familiar with L P Gas.

His first article discussed essential fundamentals in an across-the-table manner. Its a correct practice series: *Correct Practice in L P Gas Heating*.—ED.

Government Stuck

The government has become the owner of 299 prefabricated houses stored in warehouses at Pine Bluff, Arkansas. The RFC took the houses at a total cost of more than \$4,100 each, having guaranteed the manufacturer against loss if the public refused to buy. The builder sold only seven or eight in the Pine Bluff area.

AMERICAN-Standard NATIONAL ADVERTISING makes people prefer the products you sell!

WHEN you sell the American-Standard line, you're backed by the largest national advertising program in the heating industry. Full-page, full-color ads in leading national magazines . . . plus special messages directed to architects, builders, and institutional buyers . . . are *creating strong preference* for the products you sell. In fact, right in your own community, hundreds of families are being "sold" on the fine quality of American-Standard Heating Equipment.

But powerful national advertising isn't all that you get. American-Standard offers you a *complete* set of selling tools—everything you'll need to help you get a bigger share of business. All of these selling tools are fully described in a new book by American-Standard "Plan for Better Business." Ask your Wholesale Distributor for your copy now. **American Radiator & Standard Sanitary Corporation**, P. O. Box 1226, Pittsburgh 30, Pennsylvania.



AMERICAN-Standard offers a
complete set of Selling Tools to help you—



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AMERICAN-Standard

First in Heating and Plumbing

LOOK FOR THIS MARK OF MERIT—It identifies the world's largest line of Heating and Plumbing Products for every use . . . including Boilers, Warm Air Furnaces, Winter Air Conditioners, for all fuels—Water Heaters—Radiators, Convectors, Enclosures—Gas and Oil Burners—Heating Accessories—Bathtubs, Water Closets, Lavatories, Kitchen Sinks, Laundry Trays, Brass Trim—and specialized products for Hospitals, Hotels, Schools, Ships and Railroads.



YOU...profit quickly with

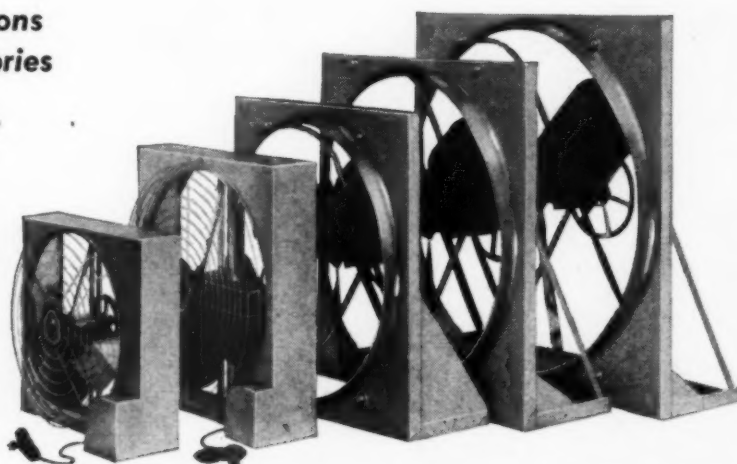
"Niteair" Fans

Mass manufactured for low-cost competitive selling!

• **Hundreds of applications
for Homes, Offices, Factories**

• **One complete line for
Industrial, Commercial
and Residential use**

• **Five diameter sizes
Eight discharge
capacities**



LAU *"Niteair" Fans*
offer YOU unlimited opportunities

More sales . . . more profits . . . new and repeat business. These are the opportunities available with LAU "Niteair" Fans. And NOW is the time to take advantage of them. You know that your 1948 merchandise must be the best you've ever offered. And at sound, practical prices, too. That's why the LAU precision manufactured line of fans is your best bet for '48.

There is a LAU "Niteair" Fan to fill every need no matter what type of installation it may be. And for economy of operation and long trouble-free service, they can't be beaten.

Now is the time to schedule summer installations. Plan ahead and fill your requirements today! For the best buy on today's market, buy "Niteair" Fans.

Write Dept. "A" today for complete details or contact your nearest jobber. No obligation.



THE LAU BLOWER CO.
DAYTON 7, OHIO

Here's to Quality!



J & H ELECTRIC MOTORS . . . Quiet, light-weight . . . more than a million have rolled off the lines of J & H during the past 22 months.



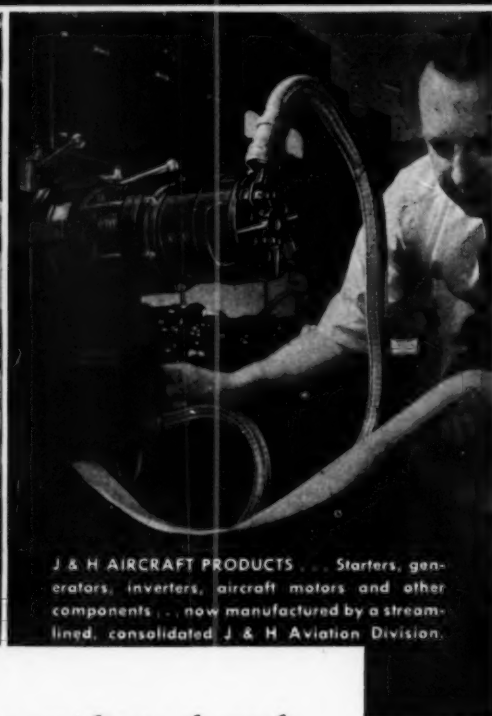
J & H CONDENSING UNITS . . . Exceptionally quiet and economical . . . improving the performance of milk coolers, freezers, ice cream cabinets and other refrigeration equipment.



J & H BALL BEARINGS . . . Made to new high standards of controlled precision . . . super-hard and tough . . . today are reducing friction and wear in automobiles, machinery and appliances.



J & H MAGNETOS . . . World-famous Eise-mann. Jack & Heintz engineers are continually improving them for easier engine starting.



J & H AIRCRAFT PRODUCTS . . . Starters, gen-erators, inverters, aircraft motors and other components . . . now manufactured by a stream-lined, consolidated J & H Aviation Division.

Jack & Heintz products . . . mass produced with laboratory precision . . . are bringing to appliances, machines, tools and engines a new high standard of quiet, smooth, dependable performance. Ask for these J & H products for outstanding quality.

Better products through

JACK & HEINTZ

Mass Precision

JACK & HEINTZ PRECISION INDUSTRIES, INC., Cleveland 1, Ohio



Timely Tips on Stainless Steel Shop Practices

(No. 5 of a series)



SOLDERING

Prepare ENDURO for best solder adhesion by using one of the stainless steel fluxes now available. To obtain full flow throughout the joint, use a large soldering copper held on top or bottom of the lap instead of edge of the seam. Reduce speed so that all parts of the joint are heated thoroughly.



GRINDING

Three precautions:

1. Be sure the ENDURO is cleaned thoroughly, and that grit is not contaminated with other metals.
2. Be careful not to overheat ENDURO by too great a wheel pressure or too fast a speed.
3. Always finish grind using a lubricant such as polishing tallow.

BUFFING

Oscillating the work is very helpful in any polishing or buffing operation on ENDURO Stainless Steel. The final buff or finishing operation should be in a straight line, and the last finishing pass must be made in the direction of rotation of the wheel.



DESIGNING JOINTS

Lap or lock seam joints are used to good advantage with ENDURO Stainless Steel. The lap joint should be made mechanically strong by spot welding or riveting, with the solder used only as a seal.



These brief suggestions are just a fraction of all the practical, shop-tested information packed into the books, "THE FABRICATION OF REPUBLIC ENDURO STAINLESS STEEL" and "THE WELDING OF REPUBLIC ENDURO STAINLESS STEEL." Covering 26 different fabricating operations and 11 welding methods, they show you exactly how to work ENDURO Stainless Steel in your own shop—how to cash in on its tremendous profit possibilities. Write for your free copies:

REPUBLIC STEEL CORPORATION

Alloy Steel Division • Massillon, Ohio
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, New York

...AND THE
BEST TIP



ALWAYS
USE ...

Republic
ENDURO STAINLESS STEEL



Other Republic Products include Black, Galvanized, Galvannealed and Electro Paintlok Sheets—Toncan Iron Sheets



From a text of the 1860's...
"A Practical Treatise on Ventilation"

"Pray, remember: fresh air, pure air gives elasticity to the step, buoyancy to the spirits, secures serenity to the pure of heart, adds a sparkle to the eye of innocence, induces good digestion and sound, refreshing sleep."

We've come a Long way since then!

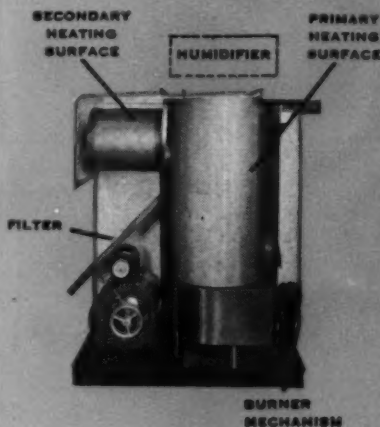


Whether or not Richmond's new Oil Winter Air Conditioner will "secure serenity to the pure of heart, or induce good digestion . . ." (see text above), we really

couldn't say. But, be sure of this: the Richmond Oil Winter Air Conditioner is specifically designed to meet every requirement in small, low-cost home installations.

Only Richmond Offers All These Features

1. Vaporizing type with unusually low pilot flame—as little heat as a gas pilot. No overheating in mild weather.
2. Automatic control of oil-air ratio at all stages of fire—keeps pot purged!
3. Delivered completely assembled and wired—estimated saving \$20 to \$35 on installation costs.
4. Horizontal design permits quick, easy duct installation on low headroom jobs.
5. Beautiful finish in durable, heavy white enamel.
6. Capacity: 75,000 Btu. at bonnet.



For complete details on the Richmond Oil Winter Air Conditioner, fill out the coupon and mail today.

RICHMOND RADIATOR COMPANY
 AFFILIATE OF REYNOLDS METALS COMPANY

Enamelled Cast Iron Ware • Vitreous China • Perma-Gloss • Gas Boilers
 Oil and Gas Winter Air Conditioners • Gas Gravity Furnaces • Radiators

Richmond Radiator Company
 19 East 47th Street, New York 17, N. Y.

4-AA

Gentlemen:

I am interested in the new Richmond Oil Winter Air conditioner. Please send me full details by return mail. No obligation, of course.

Name

Company

Street Address

City Zone State

MAKE THESE *On-the-Job* SAVINGS



Stronger, Speedier Fastenings
with
P-K SCREWNAILS

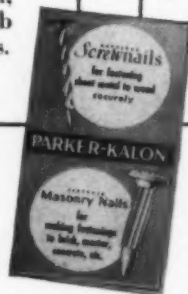
YOU SAVE TIME on many jobs by using P-K Screwnails instead of screws for fastening sheet metal to wood. Because they are hardened, they pierce metal that would bend ordinary nails... and they have over 4 times the holding power. When you drive them you can be sure they'll stay in, so, often, fewer Screwnails are needed to do the job... an added saving in work and materials.

Simpler, Lower Cost Fastenings
with
P-K MASONRY NAILS

YOU SAVE WORK as well as time and money by using P-K Hardened Masonry Nails. For making fastenings to masonry, you simply drive with a hammer. More quickly applied than lead anchors and expansion bolts, they hold securely and cost less. In comparatively soft masonry, they can be driven without drilling holes. Parker-Kalon Corp., 200 Varick St., New York 14, N. Y.

WRITE FOR

It gives complete details of P-K Screwnails and Masonry Nails, how and where to use them, with infor-



THIS FOLDER

mation on punches and masonry drills. SAMPLES, too, on request. Just tell us what you are fastening.

Sold Only Through Accredited Distributors

PARKER-KALON

P-K

SELF-TAPPING SCREWS

OTHER PARKER-KALON PRODUCTS

COLD-FORGED SOCKET SCREWS • HARDENED SCREWNAILS AND MASONRY NAILS • SHUR-GRIP FILE AND SOLDER IRON HANDLES • METAL PUNCHES • DAMPER REGULATORS AND ACCESSORIES

**No other control system offers all
these outstanding advantages...**

B-60
ALL-GAS
CONTROLS

- SELF-OPERATED,
NO OUTSIDE CURRENT
REQUIRED
- SIMPLIFIED
TWO-WIRE CONTROL
- ACCURATE
ROOM TEMPERATURE
CONTROL
- INTEGRAL
SAFETY CONTROL
- SILENT OPERATION

A completely self-contained and self-operating control system. For natural, manufactured or L. P. gases. For all kinds of domestic, commercial or industrial applications. System consists of the B-60 pilot operated diaphragm type gas valve, the T-80 Series Trimtherm Thermostat, which is scientifically correct in design, and the

ingenious pilot generator which produces the operating current, safety control, and main burner ignition. The B-60 Series of controls has set new standards throughout the gas industry. • For complete specifications on the GENERAL CONTROLS line of Automatic, Pressure, Temperature and Flow Controls, see the new 1946 Catalog 52C. • For Gas Heating Controls, request Service and Instruction Manuals.

GENERAL CONTROLS

Manufacturers of Automatic, Pressure, Temperature & Flow Controls

FACTORY SHOWROOM: PHILADELPHIA • ATLANTA • BOSTON • CHICAGO • DALLAS
KANSAS CITY • NEW YORK • DENVER • DETROIT • CLEVELAND • PITTSBURGH
MINNAPOLIS • SEATTLE • SAN FRANCISCO • DISTRIBUTORS IN PRINCIPAL CITIES



Profit by selling **STAINLESS** Roof Drainage for Quality Permanence Workmanship

There are plenty of profitable, reputation-building opportunities in the swing to stainless roof drainage systems. And the qualities of ARMCO Stainless Steel make it a "natural" for this kind of work.

You'll find that 28-gage Type 301 ARMCO Stainless Steel is as easy to work as 26-gage galvanized steel. It can be sheared and brake-formed on standard equipment. Soldering is done in the usual way for stainless steel.

As for service life, you can assure your prospects that ARMCO Stainless is one of the strongest and most durable of all metals. It withstands heavy ice and snow loads without breaking. It resists buckling and cracking caused by extreme temperature changes. Its hard, rustless surface won't discolor or stain surrounding construction. And there are stainless hangers and nails to make your jobs completely corrosion-resistant.

Remember, too, that *ARMCO Stainless Steel costs less per square foot than any other top-quality metal used for roof drainage.* All these facts add up to (1) extra profits and (2) additional orders from word-of-mouth advertising.

Get in touch with us for complete information and a free copy of the booklet, "ARMCO Stainless Steel for Gutters, Conductor Pipe and Accessories." Write The American Rolling Mill Company, 77 Curtis Street, Middletown, Ohio.

ARMCO STAINLESS STEELS



H&C No. 130

BASEBOARD REGISTER



Stackhead overlaps the register frame, preventing streaked walls caused by air leakage between frame and head. A flange for stackhead is welded to face of the register.



For **TOP-NOTCH EFFICIENCY
and A BETTER LOOKING JOB!**

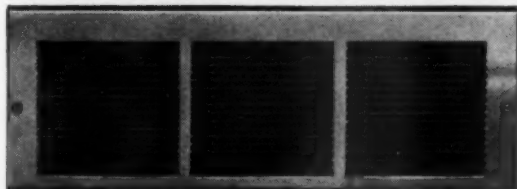


H&C No. 330 SIDEWALL REGISTER

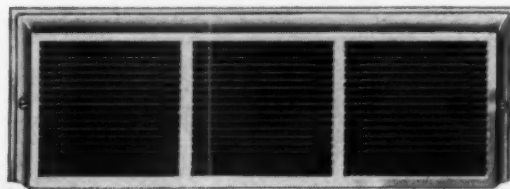
furnished with detachable flange
for fastening to stackhead

... use either the H&C No. 130 Baseboard Register or its companion Sidewall Register, the No. 330, with either the No. 623 or No. 653 Return Air Intake. The matching appearance of these excellently designed items assures an attractive, harmonious installation, and one that simply can't be beat for efficiency whether it be for ordinary gravity or conversion to air conditioning. Construction provides for quick, easy and streak-proof installation. The easy to operate register valves stay put even in air-conditioning applications; flexible fin faces permit of any desired upward or downward deflection, and all items are furnished in either our superb Metalustre or white finishes.

For installations that constantly recommend you to prospective customers, these items are tops in their class. See your jobber or write for catalog illustrating the registers best suited to every type of installation.



H&C No. 623 Return Air Intake for installation where baseboard is lower than the intake.



H&C No. 653 Return Air Intake for installation where baseboard is higher than the intake.

HART & COOLEY MANUFACTURING CO., HOLLAND, MICH.
World's Largest Manufacturers of Registers, Grilles and Furnace Accessories

FEATURES:

Full pressure
any point in the stroke

•
Infinitely-variable
stroke length

•
Quick stroke
adjustment

•
Full, instantaneous
ram control



PACIFIC *Hydraulic* PRESS BRAKE

SERIES 150 Speeds Sheet Metal Shop Production

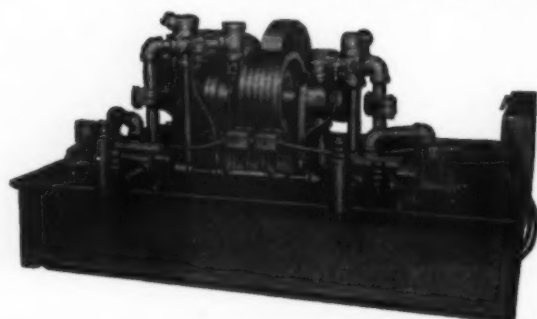
Latest in the "PACIFIC" line, this fast-acting 150-ton brake has a capacity of $\frac{1}{4}$ "x10', an overall die length of 12', and clear opening of 10'-2" between housing.

The unit shown above is owned by General Engineering & Drydock Corporation and

is installed in their San Francisco sheet-metal shop. Forming operations of virtually every type are performed on the press. Ease of set-up, the infinitely-variable and the instantly-adjustable stroke length are PACIFIC features of particular importance to this shop with its wide variety of work.

SERIES 150 Brakes are made in 6', 8', 10', 12', and 14' die length and in capacities ranging from $\frac{1}{4}$ "x6' to $\frac{1}{4}$ "x12'. Standard throat depth is 8".

Write or wire for complete data on PACIFIC Hydraulic Press Brakes. The full line includes 26 models with capacities ranging from 12 ga. x 6' to 1"x14'... and with overall die lengths to 22'. Larger units may be built to your requirements.



POWER is supplied by this simple, compact, "packaged" unit which may be mounted in a pit below floor level, leaving a clear working area on both sides of the blade. No gears, clutches or shafts are required on the press.

PACIFIC INDUSTRIAL MANUFACTURING CO.

848 Forty-Ninth Avenue • Oakland 1, California

PREMIER

FOR INDEPENDENT FURNACE DEALERS

1. Does PREMIER confine its sales to Independent Furnace Dealers only?
Answer _____
2. Does PREMIER give its dealers an Exclusive Franchise and a protected territory?
Answer _____
3. Does the PREMIER line include air conditioning, automatic fuel burning, and cooling equipment, as well as warm air heating?
Answer _____
4. Does PREMIER provide *free* factory plans for individual installations, to speed up the work and insure best heating results?
Answer _____
5. Does PREMIER have field engineers who go out on jobs, help plan special installations, close important sales, etc.?
Answer _____
6. Does PREMIER offer a complete program of selling and advertising helps?
Answer _____

This is the easiest quiz you've ever seen, because all the answers are YES! PREMIER does ALL of these things for its dealers, and in the future we are going to do even more. Why? Because we think it is good business. Because we believe our success depends upon our dealers' success.

How does your present furnace supplier stack up on this quiz? Are you still going it alone on the whole job of selling and installing? Maybe YOU would like to sample this PREMIER co-operation that is helping to KEEP independent furnace dealers independent.

Drop us a card. We'll gladly tell you more about PREMIER co-operation — show you how PREMIER can help you achieve greater future security.

PREMIER
Personalities
Ralph E. Waldo
Field Engineer

"My experience with PREMIER, as well as my past experience in both the retail and wholesale end of the furnace business, has given me a pretty good idea of the kind of co-operation a dealer should have from the manufacturer. I am convinced that this new PREMIER program is going to help provide greater security for PREMIER Dealers in the future."

PREMIER FURNACE COMPANY, Dowagiac, Mich.

STEEL FURNACES

CAST IRON FURNACES

WINTER AIR CONDITIONERS

OIL BURNERS

HUMIDIFIERS

BLOWERS

Something New!

The "PLUG-IN"

Chronotherm

**Quick
Profits
for you**

AT LAST AN

- Over the Counter - Item for the Heating Trade

HERE'S NEWS! Honeywell engineers have come up with a "Plug-In" Chronotherm that will replace most old type thermostats and can usually be installed by the householder in 10 minutes. No concealed wiring to bother about. No basement work. Just detach the present thermostat from its mounting. Replace with Chronotherm, tighten screws, and plug the cord in any live electric outlet. About as simple as installing an electric clock. The Chronotherm starts saving fuel and furnishes maximum comfort immediately.

IT'S A SPOT SALE ITEM!

No more troublesome installation problems. Sell Chronotherm as a package and let your customer connect it. Or better still, sell it in

the home and connect it yourself while you're demonstrating it.

WONDERFUL HOUSE-TO-HOUSE ITEM

Send out your salesmen. Tell them to hook up the new "Plug-In" Chronotherm while on the job. They'll make big money for themselves and bigger money for you. Have your service men carry several with them—show the "Plug-In" Chronotherm on every call—a demonstration will sell it.

HELP BEAT THE FUEL SHORTAGE

All fuel conservation campaigns recommend lowered night temperature. The Chronotherm does this automatically—saves fuel and gives carefree comfort 24 hours a day.

73 BRANCHES FROM COAST TO COAST WITH SUBSIDIARY COMPANIES IN: TORONTO • LONDON • STOCKHOLM • AMSTERDAM • BRUSSELS • ZURICH • MEXICO CITY



CUSTOMER REPLACES HIS OLD THERMOSTAT with the "**PLUG-IN**" CHRONOTHERM

usually requires **Only 10 minutes**

ADVERTISE AND SELL

Honeywell is promoting the "Plug-In" Chronotherm nationally, with powerful selling copy. We've also prepared strong selling ads for use in your local newspaper and spot announcements for local radio stations. Run a few of these. And start selling "Plug-In" Chronotherms.

GET YOUR ORDER IN NOW

This is a real over the counter item that will increase your profits. Take advantage of its tremendous sales possibilities. More profit for you—important fuel savings for your customer. Order your requirements today. Write or call us about advertising and promotional material —start selling NOW.

**SEND FOR THE
WHOLE STORY**

MINNEAPOLIS
Honeywell
CONTROL SYSTEMS

MINNEAPOLIS-HONEYWELL, MINNEAPOLIS 8, MINNESOTA . . . IN CANADA: TORONTO 12, ONTARIO

You're IN on ANY JOB with

Luxaire's 3 in 1

AIR CONDITIONING UNIT

ENGINEERED FOR

1

COAL

Hand Fired • Stoker Fired

2

EASILY CONVERTED
and well adapted for

3

OIL

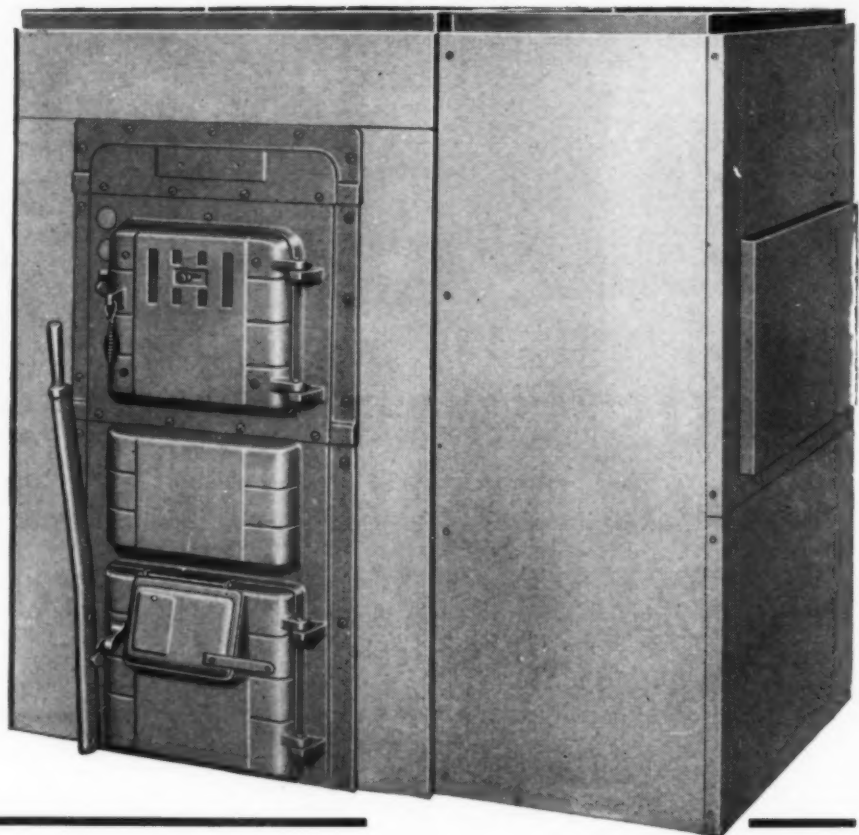
and
GAS

Luxaire's "3 in 1" coal unit has been designed and is constructed to provide all the necessary requirements and versatility for converting to oil, gas, or stoker firing at any time.

The compact, enameled steel cabinet houses both the heating and blower compartments . . . the rugged, steel heating element with long fire travel and large heating surface, most essential for conversion, is welded leak-proof and gas-tight.

The blower compartment can be assembled at either the right or left side of the heating compartment for flexible heating installations.

An automatic humidifier is standard equipment.



AC-700-F



Series G
Gas-Fired, Steel
Gravity
Furnace



Series H
Gas-Fired, Utility
Steel Air
Conditioning Unit



Series CA
Gas-Fired, Cast
Iron Air
Conditioning Unit



Series O
Oil-Fired, Steel
Air Conditioning
Unit



Series VH
Oil Fired, Steel
Utility Air Con-
ditioning Unit



Series 700
Coal-Fired, Steel
Gravity
Furnace



Series C
Coal-Fired, Cast
Gravity
Furnace

THE C.A. OLSEN MANUFACTURING COMPANY

Luxaire



HEATING & AIR CONDITIONING UNITS

ELYRIA 12, OHIO

Air Controls

NEW



CEILING DIFFUSERS WITH AIR FLOW RINGS

EFFICIENT-LOW COST DIFFUSERS FOR CEILING AIR DISTRIBUTION

The new Air Control Ceiling Diffusers have been designed to answer the demand for a better, lower cost ceiling diffuser for Residential and Commercial heating, ventilating and cooling. Built of a series of circular Air Flow Rings, curved to direct the air in a horizontal path — resulting in draftless air distribution with low resistance.

The curved contour of the Air Flow Rings and the flush design of these Diffusers results in a unit that is attractive and inconspicuous.

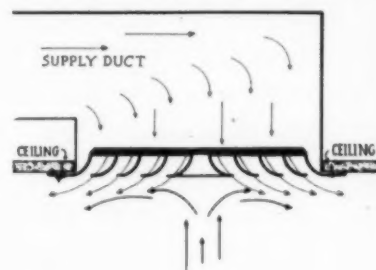
Die stamped in five sizes — to fit round openings 6", 8", 10", 12" and 14" in diameter — they are mass produced at a surprising low cost.

When you see the new Air Control Ceiling Diffusers you'll agree that this is the ideal answer to your ceiling air distribution problems.

See your AIR CONTROL Jobber or write for complete data and prices

AIR FLOW RINGS Give Better Diffusion and Lower Resistance.

Note how the scientific contour of the AIR FLOW RINGS smoothly deflects the air stream — with a minimum of resistance. Air from



Ceiling Diffuser is deflected outwardly in a horizontal plane. Series of circular jets with alternate vacuum areas results in rapid diffusion — mixing air supply with room air. Results in better air mixing and temperature equalization.

AIR CONTROL PRODUCTS, INC. LOOPERSVILLE, MICH.



"FRESH GUY"

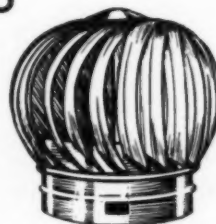
WESTERNAIRE ROOF EXHAUSTER

Brings the Freshness of Outdoors to the Interior

THIS WESTERNAIRE Roof Exhauster is built to do a tough job, bringing pure fresh air into the foundry, factory or other large building or room that suffers for lack of air. The Westernaire Exhauster is fabricated from heavy gage steel. It's equipped with dirt and moisture proof sealed ball bearings. Automatic shutters if desired. Easy to sell. Easy to install. It's a "fresh guy" that will pick up profitable cash customers for you by the score!

Western ROTARY VENTILATORS

Free air turbine type. Ball bearings sealed in dust proof, moisture proof housing. Operates on 2 mph breeze. No attention needed. Quiet operation. Long life. Gives exhaust unequaled by any stationary ventilator of same size. Bearings guaranteed for the life of the ventilator.



**JOBBER
WANTED**

Write for Catalog—Engineering and Ventilating Service

Western

ENGINEERING & MANUFACTURING CO.

1726 E. WASHINGTON BLVD.
LOS ANGELES 21, CALIF.

510 NO. DEARBORN ST.
CHICAGO 10, ILL.

*Cash in
on small home
heating*

WITH

THATCHER'S NEW A-204

You know how important small homes are to profits these days. Thatcher does too. That's why Thatcher tailored the NEW A-204 specifically for this market. You'll find this automatic, oil-fired Winter Air Conditioner amazingly compact — designed for the kind of easier selling that means bigger profits for you.



NEW A-204
Automatic Oil-Fired
Winter Air Conditioner

THESE FEATURES MAKE SELLING EASIER

- Vaporizing gravity feed forced draft burner — firing rate pre-set, recommended consumption 0.8 gallons per hour.
- Three-point furnace body suspension—assures positive leveling, prevents heat transfer.
- Low casing temperature — approved type replaceable filters.
- Safety Feature prevents oil fill-up — in case of electrical failure unit automatically returns to low fire pilot operation.
- Shipped as a completely packaged unit. Automatic Humidifier is standard equipment.

NEVER BEFORE so much heat from so compact a unit. Thatcher's NEW A-204 is 36" high, 23½" wide, 39¾" long — weighs less than 275 pounds, yet it delivers 65,600 BTUs at register. Here's 50% greater space utilization per BTU output. Field tested and proven, the NEW A-204 meets the most exacting requirements.



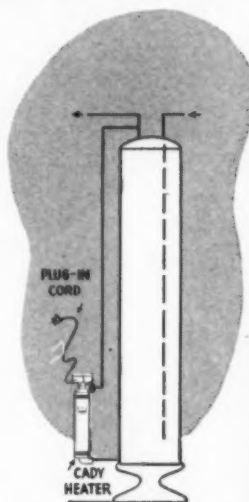
GARWOOD, NEW JERSEY



HERE'S AN *Easy Set-up*
FOR ADDED SALES
in the warm air furnace market!

**AN ELECTRIC
WATER HEATER**
that you can install

- NO NEW WIRING NEEDED
- ONLY 2 PIPE CONNECTIONS
- DESIGNED FOR ANY
5 TO 30 GALLON TANK.



THE NEW CADDY ELECTRIC WATER HEATER offers you a worthwhile opportunity to get an added share of business in the warm air furnace market. It's fast-selling because it's low-cost, clean, odorless, trouble-free, dependable and economical. A money-maker, because it's so easy to install. All you do is connect two $\frac{1}{2}$ " pipes to the range boiler, and plug it into any 110-120 volt A.C. wall outlet.

The Cady Water Heater is a quality product throughout. Heating element approved by Underwriters' Laboratories. Copper and brass waterways throughout. Fiberglass insulated metal jacket. Positive, built-in automatic control. 1000 watt heating element. 6-foot plug-in cord. Recovery rate: 5 gallons per hour, 80°F. rise. Temperature adjustable 80° to 180°. Size 4 $\frac{1}{2}$ -16 $\frac{1}{2}$ " overall. Write for full particulars. THE CADDY COMPANY, Dept. S, 123 Georgia Avenue, Providence 5, R. I. (Subsidiary of General Fittings Co.)



AUTOMATIC

CADDY
WATER HEATER

ELECTRIC

HOW **COLD** WILL YOUR STATE GET NEXT WINTER?



The severe winter of 1947-48 may not repeat — but — homeowners are in a mood to discard inadequate heating plants. Now is the time to start your program of replacement, while the days of discomfort are fresh in the minds of your prospects.

The established economy of MOR-SUN will back up the easy selling job its beauty gives you.

Check your complaint file — Now — and start replacing obsolete, undersized plants with MOR-SUN die-cast steel furnaces — oil or gas fired.

The INITIAL cost is less!

The INSTALLATION cost is less!

The SERVICE cost is less!

"The Sun Never Sets with MOR-SUN!"

MORRISON STEEL PRODUCTS, Inc.
BUFFALO 7, N. Y.





IT'S HERE

The

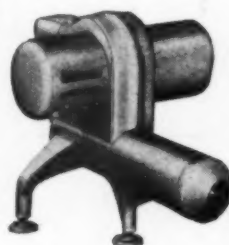
NEW LOOK



3 Boiler Burner Units with the "New Look"—Capacities from 475 to 840 sq. ft. of standing hot water. Designed for maximum heat absorption; water jacketed combustion chamber faces flame on the top, bottom and three sides.



Air Conditioning Furnaces with the "New Look" . . . 85,000, 120,000 and the *new* 150,000 B.T.U. per hour Models. The *new* unit gives more sales openings in medium-large homes! Also for large homes, the dependable 200,000 B.T.U. Model.



4 Pressure Burners
Firing Rates from 7/10 to
12 gallons per hour



2 Wall Flame Rotary
Models Firing Rates from
 $\frac{1}{2}$ to $4\frac{1}{2}$ gallons per hour

...IN fluid heat's AIR CONDITIONING FURNACES and BOILER BURNER UNITS!

**Packed with EYE-APPEAL
for Greater BUY-APPEAL...**

THE FASHION-PLATES of the Industry... they're the new Fluid Heat Air Conditioning Furnaces and Boiler Burner Units! Triumphs of the industrial designer's art, they're colorful, streamlined, styled to please the eye of the most fashion-conscious consumer!

There are solid engineering improvements, too! The jackets are mounted on rubber to deaden sound and reduce possibility of air leaks. The fan housing is raised on rubber feet to absorb sound and hold it permanently in position, while permitting easy removal. The fan housing is also inserted through the partition in felt gaskets to eliminate metal-to-metal contact. The heat exchanger has adjustable legs for proper alignment. The entire front lifts off easily for quick service access. And Fluid Heat Air Conditioners have much greater filter area—using *two* filters in a tent shape.

**... with the "OLD LOOK" in Fluid
Heat's Outstanding Performance!**

The fuel-saving features of Fluid Heat units remain as important as ever. Fluid Heat still offers you a wide choice of models—husky construction to reduce your service problems—a sound, competitive price structure—and a wide-awake development laboratory to keep you ahead of competition. If you weren't fortunate enough to see Fluid Heat's "NEW LOOK" at the National Oil Heat Exposition, write today for our descriptive folder and full details on a profitable Fluid Heat Dealer Franchise. Address: FLUID HEAT DIVISION, Anchor Post Products, Inc., 6720 Eastern Ave., Baltimore 24, Maryland.

**Introducing
The Latest in Heating
... CONTINUOUS AIR
CIRCULATION**

In this modern warm air heating method, the blower speed is changed to deliver less air at any given moment—but a more even flow at all times through much longer blower operation cycles. Result: a more pleasant atmosphere and more even heat throughout the whole house—elimination of air stratification, "cold 70°" and gravity action—better heating in distant rooms. No increase in power consumption because the blower operates at reduced R.P.M. Less stopping and starting make it easier on the motor, too. Continuous Air Circulation is an important feature of new Fluid Heat Air Conditioners... *at no extra cost!*

*The Fashion Plates
of the Industry*

fluid heat
OIL BURNER

"WORLD'S ECONOMY CHAMPION"

Manufactured by Anchor Post Products, Inc.
Baltimore 24, Md., Established 1892



NEW CHEVROLET ADVANCE-DESIGN '48 TRUCKS ARE LOWEST IN PRICE!

and have *all* these new and finer features

Here are the *newest* trucks—the *latest* and the *greatest* features—the *biggest* values—with the *lowest prices* in the volume field! Model for model, and with comparable equipment and specifications, Chevrolet Trucks *list for less* than competitive makes—some models as *much as \$150!* Here is Advance-Design that provides the cab that “breathes,”* Flexi-Mounted Cab, Uniweld all-steel cab construction, fully adjustable seat, all-round visibility with rear-corner windows,* extra-durable frames, specially designed brakes, and many other features that put Chevrolet trucks far ahead of the field. See them at your Chevrolet dealer's.

CHEVROLET MOTOR DIVISION, GENERAL MOTORS CORPORATION
DETROIT 2, MICHIGAN

*Fresh air heating and ventilating system and rear corner windows optional at extra cost.

NEW CHEVROLET 4-SPEED SYNCHRO-MESH TRUCK TRANSMISSION



This Chevrolet-developed Synchro-Mesh transmission in heavy-duty models provides new ease and efficiency.

NEW CHEVROLET ADVANCE-DESIGN GEARSHIFT CONTROL



Steering-column gear shift (on models having 3-speed transmission) gives new freedom to the driver, leaves cab floor unobstructed.

NEW FOOT-OPERATED PARKING BRAKE



Chevrolet's foot-operated parking brake (on models with 3-speed transmission) provides new clear floor area.

NEW IMPROVED CHEVROLET VALVE-IN-HEAD ENGINE



The world's most economical engine for its size. Has greater durability and operating efficiency.

NEW MULTIPLE-FEATURE DEVELOPMENTS



New splined rear-axle shaft attachment to wheel hubs in heavy-duty models. . . . Heavier springs New propeller shaft bearing-support and seal design.

if it's from Weirton . . .

IT'S BETTER STEEL

Nowhere is steel production possible under more favorable circumstances than at Weirton. Compact, carefully integrated with all essential personnel "under one roof," Weirton has every facility to make good steel . . . to make it right . . . to make it fast.

Mill facilities are maintained at a peak of operating efficiency. Centralization and coordination of metallurgists, chemists, production men, salesmen and shipping supervisors brings to bear upon your problem all the talent that is necessary to make good steel, and get it to you.

When you entrust your needs to Weirton, you have a source of supply on which you can rely, for dependability is one of the principal ingredients of Weirton service.

WEIRZIN
Electrolytic Zinc-Coated
Sheets and Strip,
Plain or Bonderized

WEIRITE
Hot-Dip and Electrolytic
Tin Plate,
Tin Mill Black Plate,
Plain or Bonderized,
and Special Coated
Manufacturing Ternes

WEIRTON
High-Carbon Strip

WEIRALEAD
Lead Alloy Coated Sheets
and Long Terne Sheets

WEIRCOLOY
Galvanized Sheets
and Roofing Products

N-A-X HIGH-TENSILE
Low-Alloy Steels

LACQUERED
and Coated Steel Strip

ALSO
Cold-Rolled Sheets and Strip
Hot-Rolled Sheets and Strip
Structurals

WEIRTON STEEL CO.

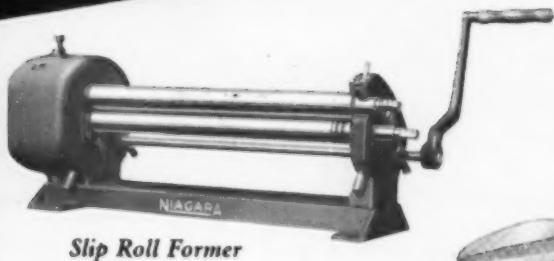
WEIRTON, WEST VA., Sales Offices in Principal Cities

Division of NATIONAL STEEL CORPORATION Executive Offices, Pittsburgh, Pa.



TINNERS TOOLS *and* MACHINES *for* SHEET METAL SHOPS

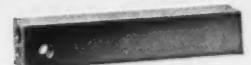
Niagara offers America's most complete line of tanners tools, machines, power presses and shears for production and maintenance. Whether you require hand, foot or power operated equipment, — you get the best when you specify Niagara. Write for catalog 94.



Slip Roll Former



Ring and Circle Shear



Rivet Sets and Headers



Snips



Electric Combination Machine



Foot Gap Shear



Hollow Punches



Hand Groovers



Crimper and Beader

NIAGARA

NIAGARA MACHINE AND TOOL WORKS, BUFFALO 11, N. Y.
DISTRICT OFFICES: NEW YORK, CLEVELAND, DETROIT



$$2 \times 2 \times X =$$

*Good Business
(and good profits)
For You!*

For You Who Service and Sell Warm-Air Furnaces

2 is the two (or more) filters that go into each furnace

2 is the two filter changes per year required in many localities

X is the number of modern warm-air furnaces in your area.

Here's a formula that means good business, and good profits, for you who service and sell modern warm-air furnaces. Substitute the number of your customers for "X", and you will see its profit possibilities.

It's good business because it's a repeat-sale proposition that increases your profits with each cycle. First, there's a good profit on each sale of DUST-STOP* Air Filters. Second, there's an opportunity for extra profits. Every time you make a filter replacement, you can check for additional service business. Vice versa, every service call offers a chance to check air filters. These services complement each other.

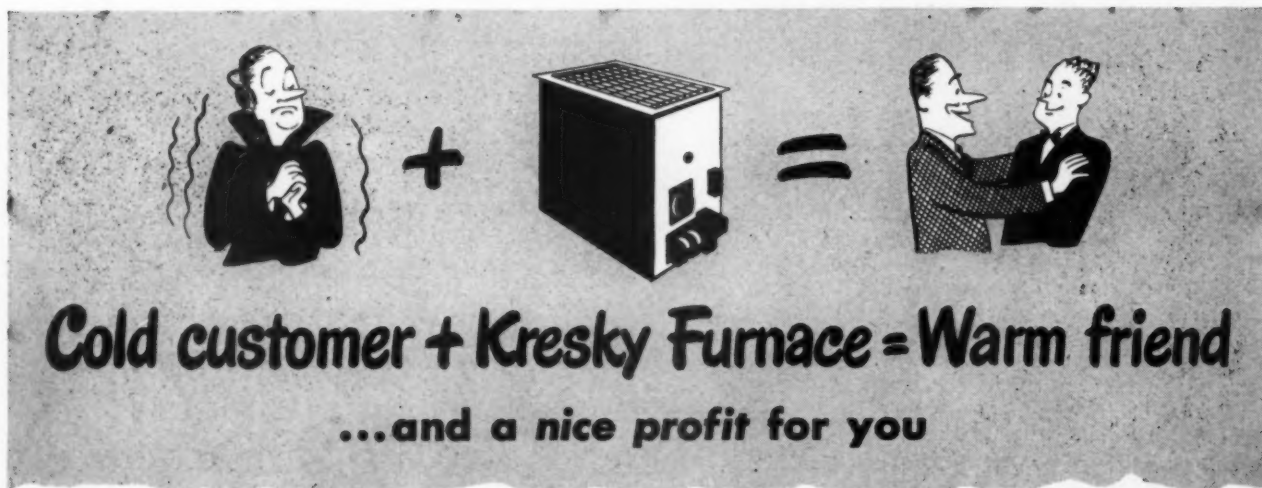
Balancing this ideal setup, you'll find that air filters—yes, even DUST-STOP Air Filters—still have to be sold. Unless your customers are told how to get the most out of their furnaces by keeping filters clean, they seldom realize the savings possible in fuel, money and housekeeping. To help you, there's the weight of strong national advertising behind DUST-STOP Air Filters, plus timely selling helps. They can turn your off season into a profit season. Contact your DUST-STOP distributor, jobber, or write Owens-Corning Fiberglas Corporation, Dept. 930, Toledo 1, Ohio.

In Canada: Fiberglas Canada Ltd., Toronto, Ontario

DUST STOP AIR FILTERS
—a Fiberglas* product

*T. M. REG. U. S. PAT. OFF.





Install the KRESKY *Evenheat* Oil Floor Furnace in the new or remodeled homes of your customers and they're sure to tell others that you certainly "did right by them." And that sort of thing snow-balls, you know. The Kresky *Evenheat* is one of the most popular oil furnaces on the market today, and here are a few reasons why:

Low initial and operating cost

The famous patented Kresky burner, basic unit of *Evenheat*, is simplicity itself, allowing us to effect many savings in manufacturing costs—savings we pass on to you. Immediate heat from a fire that is *always* clean—soot free—and hot, assures warmth when you want it—and less oil consumption.

Very easily installed

A Kresky *Evenheat* floor furnace is almost a plug-in unit, it's that easy to install. Requires only three feet of clearance under the floor—less than any other comparable heater.

Always clean instant heat

Air is mixed with the gases from the oil in the burner in just-right amounts by an electrically operated blower to give instantaneous clean heat, which is then forced through the home by a circulating fan.

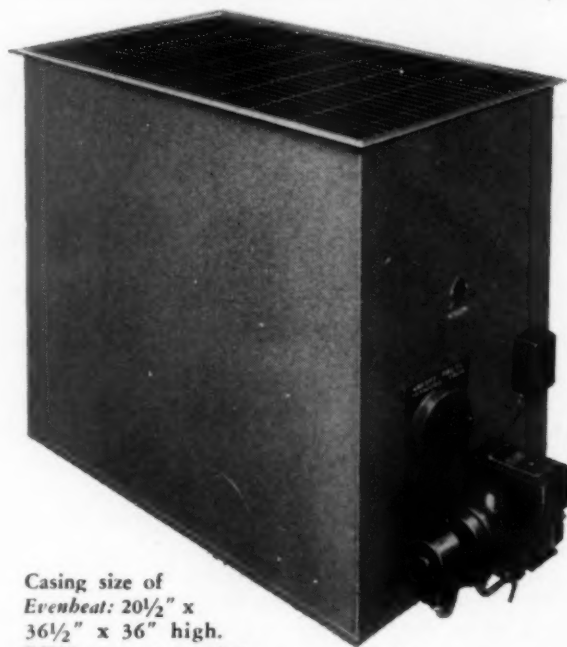
Safe as safe can be

The Kresky *Evenheat* is completely enclosed in a double casing separated by adequate air space. This insulates the furnace, keeping the outside casing cool—an important safety feature.

Automatic and really rugged

Intake of oil and air induction are so synchronized that you get clean healthful heat in amounts you want when

you want it without the slightest bother. The best of heavy gauge steel and the finest of materials, plus the famous Kresky workmanship is your guarantee of long life and complete customer satisfaction.



Casing size of
Evenheat: 20½" x
36½" x 36" high.
BTU output, 72,800.

Shipping weight, 237 lbs. Also comes in dual register and super models. Write for our 1948 catalogue for information about our full line of commercial and domestic ranges and furnaces. Increased plant facilities allow us to make faster deliveries on all models.

NOTE TO DEALERS

If you are interested in a dealership, please let us know. There may be an opening in your locality.



Dept. AA

KRESKY MFG. CO., INC.
Petaluma, California



TOPS IN SHEARING

Accuracy Ease of Operation and High Production are key features of Wysong and Miles Precision Shears. The massive, balanced semi-steel construction insures perfect alignment and prevents twist, spring or deflection.

Compensating Holddown The holddown feet are individually spring-actuated; independent plungers automatically and securely clamp even short widths of material. Varying gauges can be sheared without adjustment.

Friction Clutch Disc-type, treadle-activated clutch engages with minimum of shock. For safety,

non-repeat unit can be set, stopping shearing action after each cycle. When on repeat, machine will shear continuously as long as pedal is depressed.

Precision Back Gauge The self-measuring ball-bearing parallel back gauge is easily set to .0078 (1/128th) of an inch. One end of gauge bar is adjustable for taper shearing.

These Features and every other detail make the No. 1296 a uniformly superior squaring shear. Jigs and fixtures are used in the machining and drilling of every part of every Wysong and Miles machine.

Other Squaring Shears in 10, 12, 14 gauge. Write for complete information.

WYSONG and MILES Co

GREENSBORO, NORTH CAROLINA

THE FINEST IN SQUARING SHEARS AND BENDING ROLLS



WR-72 (Forced Air): Capacity 72,000 B.t.u. output at bonnet. Equipped with blower. Special plenum 32½" high, with cap, available as extra equipment; extends to ceiling height of 7'4".



All cast iron heat exchanger; return flue radiator design. Rocking and dumping grates.

WG-42 (Gravity): Capacity 42,000 B.t.u. register. Equipped with bonnet. Dimensions — 28" x 28" x 46½" high (to bonnet).



Mueller Climatrol gives you the edge for small-home business

—with these two furnaces . . . designed for low-cost homes,
but meeting the high Mueller standards for appearance and efficiency

You are in a winning position when you talk Mueller Climatrol to the man building a \$5,000 to \$10,000 home today. He wants heating efficiency and economy in a furnace scaled to the size of his home — at a price that is in line with his overall costs. You have just what he wants, for either gravity or forced-air — in the WG-42 and the WR-72 Mueller coal-fired furnaces.

Furthermore, the furnace you offer him is quality merchandise, built to give full dollar value in years of economical comfort. It is equipped with barometric draft regulator and

complies with U.S.C.S. 109-44 for F.H.A. approval. It has been engineered to meet the high operating standards that have kept the Mueller name out in front for more than 91 years.

Small homes offer you a profitable volume of business. Go after it! Capitalize on the selling advantage these two furnaces give you. Remember — for any job, large or small — sell Mueller Climatrol! It really pays! Write for bulletins. L. J. Mueller Furnace Co., 2010 W. Oklahoma Avenue, Milwaukee 7, Wisconsin.

MUELLER
Climatrol

0-45

REG. U. S. PAT. OFF.



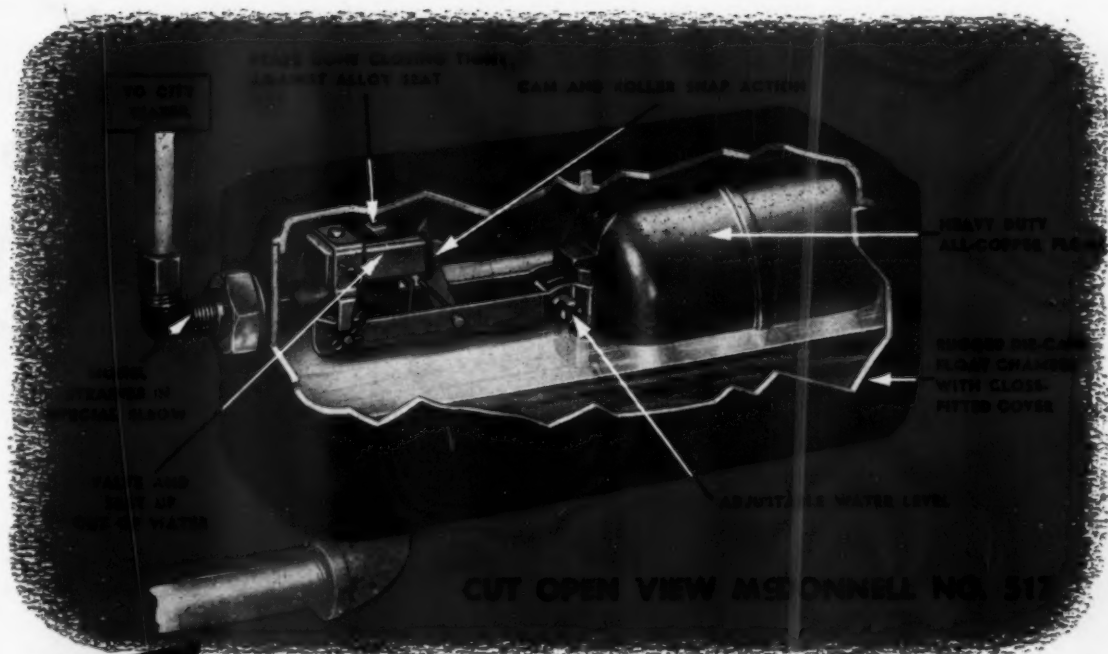
FOR GAS



FOR OIL



FOR COAL

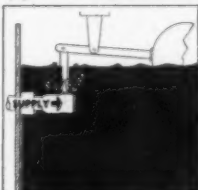


THERE'S NOTHING LIKE IT!...

A man who knows his float valves examined the McDonnell Float Valve pictured here and said, "Looks like you are the first people to take this matter seriously!"

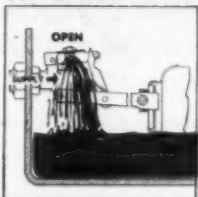
You quickly discover how well this description fits the McDonnell No. 417 when you compare it with other valves. Everything about it—in both design and construction—shows that its development was one more chapter in the story of "Doing One Thing Well"—to you who use them, a *vital* thing.

★ NO DRIBBLING



temperature, it is soon plugged up with lime or is clogged by debris and foreign matter as you know only too well.

★ INSTEAD OF DRIBBLING—SNAP ACTION!

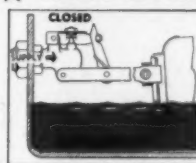


Moreover it seats tight against water supply pressures up to 150 lbs.

By its very nature, the conventional float valve is sure, sooner or later, to get into trouble. Basically, it is simply a float and arm attached to a valve which cracks open and dribbles water into the pan as soon as the water level begins to fall. Obviously, such a valve is rarely wide open. It simply attempts to maintain a level by constantly dribbling water. Exposed, as it is, to high

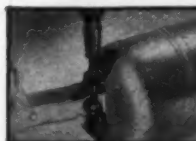
The biggest difference in the McDonnell Float Valve is the valve mechanism which gets away from this dribbling action. Its ingenious cam and roller construction snaps it wide open when the float drops $\frac{1}{4}$ inch. This opens up a full stream of water . . . thoroughly flushes out the seat. When the water level is restored, the cone seats with the same positive snap ac-

★ TIGHT CLOSING VALVE—UP ABOVE WATER



This positive "snap action" alone would place the No. 417 in a class all its own, but it is only proof-number-one that there is nothing else like it. In the current model the valve and seat are up out of the water. The brass cone is firmly thrust into an alloy seat to provide a water-tight closure.

★ FLOAT LEVEL ADJUSTABLE



A heavy gauge copper float (not plated) gives ample float power, and an outstanding feature is the slide which permits raising or lowering the float by merely loosening one screw so that the water level in the pan can be adjusted.

★ MONEL STRAINER PROTECTS VALVE



An extra precaution to assure positive operation is the monel strainer mounted in a special compression fitting connected to the city water supply, where it can be easily removed and cleaned. With the valve located out of the water, with the sluicing action of a full stream to keep it clean, and with the added safeguard of the strainer in the water supply line, you can be sure *this valve will work right*.

★ INDIVIDUALLY TESTED

Everyone of these valves is individually tested. Their feeding action is tested and their ability to seat against water pressure up to 150 lbs. is tested. Leading manufacturers of warm air furnaces, air washing equipment, dehumidifying apparatus, and cooling equipment have adopted the McDonnell Snap Action Valve. They are available without float chamber (No. 417) or mounted in a sturdy die-cast chamber with seat, well-fitted cover (No. 517). In these two forms they are adaptable to every requirement for a valve of this kind. Ask for details.

MCDONNELL & MILLER, INC., 1318 Wrigley Building, Chicago 11, Illinois

Doing One  Thing Well

MCDONNELL SNAP ACTION FLOAT VALVE

... with the ingenious ACTION

Now... A FULL LINE OF READY-TO-USE BERGER DRAINAGE PRODUCTS

MADE OF REPUBLIC

Enduro
By U.S. Steel Co.

**STAINLESS
STEEL**



Berger Stainless Steel Drainage Products includes Snapfit Eaves Trough; "K" Gutter; Plain Round, Corrugated Round and Corrugated Square Conductor Pipe; plus a complete line of all necessary stainless steel fittings.

● Here it is—one of the greatest values you've ever been able to offer your customers—a *COMPLETE* stainless steel drainage system with all ready-to-use materials available from one dependable source... and made of a metal already proved through more than 20 years of service in buildings of every type.

Berger brings you a full line of drainage products made of 28 gauge ENDURO Stainless Steel, Type 301, in satin finish.

Now, you can offer your customers a drainage system that will last for the life of the building... that is stronger than ordinary steel... that is attractive in appearance... that will not rust or tarnish, does not bleed or discolor paint... that requires little or no maintenance... that costs less in the long run.

Although unnecessary, Berger Stainless Steel Drainage Products may be painted if desired. They are simple to install and easy to solder.

Get ready NOW to cash in on profitable business by seeing your JOBBER or writing us for full information.

**BERGER MANUFACTURING DIVISION
REPUBLIC STEEL CORPORATION
CANTON 5, OHIO**

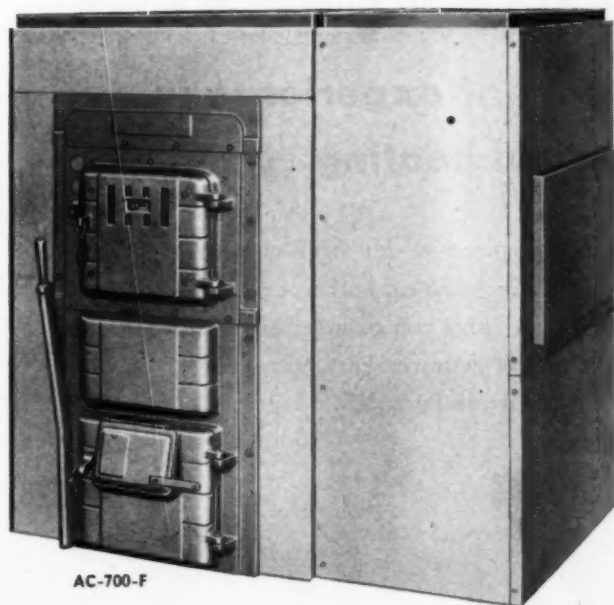
Warehouses in Boston, Philadelphia and St. Louis



MONCRIEF'S "HEATOMATIC"

Air Conditioning Unit

is the **BIG NEWS** in the Heating Market



AC-700-F

The
ALL FUELS Unit
that is
EASILY CONVERTED
WELL ADAPTED
for
**GAS
OIL
COAL**

● Here's the coal-fired air conditioning unit that can be readily converted at any time, even after installation, to burn oil, gas, or for stoker firing, because . . .

The excellent design and construction of the rugged steel heating element, with long fire travel and large heating surface, provide the necessary qualifications for the

versatility of this unit.

A new cabinet that allows the full height blower compartment to be assembled at either side, is finished in smooth, glossy baked enamel.

An automatic humidifier supplies the necessary moisture.



Series W
Gas-Fired, Steel
Gravity Furnace



Series U
Gas-Fired, Steel
Utility Air Con-
ditioning Unit



Series CL
Gas-Fired, Cast
Iron Air Con-
ditioning Unit



Series P
Oil Fired, Steel
Air Conditioning
Unit



Series VU
Oil Fired, Steel
Utility Air
Conditioning Unit



Series 700
Coal-Fired, Steel
Gravity Furnace



Series C
Coal-Fired, Cast
Gravity Furnace

THE HENRY FURNACE COMPANY

Medina, Ohio

HEATING AND AIR CONDITIONING UNITS

MONCRIEF

SINCE 1895

FURNACE PIPE AND FITTINGS

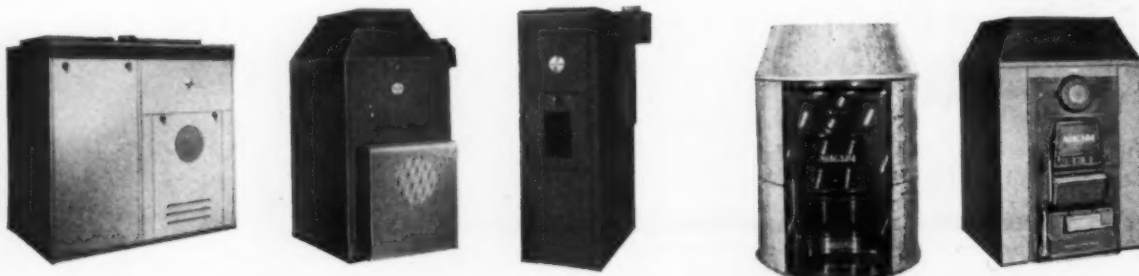
NIAGARA

GAS • COAL • OIL FURNACES

**Backed by 56 years of experience in
manufacturing residential heating equipment**

• In these days of fuel restrictions, you must have a heating line that fills *all* requirements. That's Niagara—backed by 56 years of manufacturing residential heating equipment—a line that has a wide

reputation for high-quality construction and economical operation—a line that enables you to meet any residential heating requirements, gas, coal or oil. Write for the complete Niagara story.



GAS-FIRED—Niagara gas-fired furnaces are available in 17 different models. The Series 20 winter air-conditioners and gravity furnaces, all with cast-iron heating elements; the Series 10 air-conditioning and gravity units with steel combustion chambers; and two utility models of 75,000 and 100,000 BTU.

COAL-FIRED—Niagara coal-fired furnaces are available in many sizes, with cast-iron or steel heat exchangers, and in round or square casings. Niagara blowers are supplied as package units for installation with square-cased furnaces.



*See our
Exhibit*

at Greater
Cleveland
Home and
Flower Show

OIL-FIRED—Niagara Oil-Fired Winter Air Conditioners are available in two sizes—90,000 and 135,000 BTU at registers. Completely equipped with automatic controls and pressure (gun-type) burner. Available also without burner.



NIAGARA FURNACE DIVISION • The Forest City Foundries Company • 2500 West 27th Street, Cleveland 13, Ohio

GAS, COAL *NIAGARA* **OIL**

GRAVITY AND WINTER AIR CONDITIONING UNITS

WINKLER challenges any Oil Burner

to *Match these Tests!*

A truly sensational advance! The Winkler LP* Oil Burner introduces a kind of performance never seen before—presents features which amaze the experts! The tests described below will change your conceptions of oil burner efficiency. The Winkler LP* Burner maintains a constant fuel-air ratio with any grade of oil and under the most adverse conditions. Among its design features are —

1. Non-clogging nozzle.
2. Exclusive air cone stabilizer.
3. Positive metering of fuel oil regardless of viscosity.

Burning rates from $\frac{3}{4}$ to $1\frac{1}{2}$ GPH make this burner adaptable to small installations, eliminating the waste of over-sized fires. In addition, the Winkler LP* burns catalytically cracked oils as efficiently as any other kind.

Write at once for complete information.

DISTRICT MANAGERS WANTED

Winkler's expanded program in merchandising automatic heating equipment requires additional field managers. This is an outstanding opportunity for experienced high grade men to make substantial earnings in franchised territories. Write today, giving full information on your qualifications.



**THE NEW
WINKLER
LP*
OIL BURNER**
*LOW PRESSURE



Fuel-Air Ratio Test

A standard No. 1 fuel oil was burned in a $\frac{3}{4}$ GPH Winkler LP* Oil Burner, adjusted to burn cleanly and produce 11% CO₂ in the flue gas.

Without further adjustment, a No. 3 fuel oil was substituted. No change was noted in the CO₂ analysis and the fire remained absolutely clean.

Again, without adjustment, a standard No. 3 industrial 100% catalytically cracked, untreated fuel was substituted. The fire remained clean and the CO₂ reading increased to 11½%.

Finally, an unrefined, black crude was fed to the burner, still without adjustment. The CO₂ reading was 11½% and the fire clean.



Water Test

Water was dripped into the oil line of a 1 GPH Winkler LP* Burner at the rate of $\frac{1}{4}$ gallon per hour and the test continued for one hour. At no time was the fire extinguished and the unit operated satisfactorily when manually started and stopped at frequent intervals.

This test further indicates the matchless ability of the Winkler LP* to handle low grade fuels, containing not only impurities but slugs of water.



Dirty Oil Test

A standard production $\frac{3}{4}$ GPH Winkler LP* Oil Burner was installed in an Arcola boiler located in an automotive service station. All crank case, transmission and rear axle drainings obtained by the service station were burned in the Winkler LP*, actually heating the building. No filter or dirt trap was used.

The burner received oil other than waste oil only when the waste supply was low, in which case No. 4 fuel oil was added—estimated to be less than 20% of the total oil burned.

The test was run for 60 days during which approximately 1000 gallons of oil were burned. During the test the burner needed no adjustment whatever. CO₂ content of the flue gas was 11% at the start of the run and was found to be 11% at the end of the run. Absolutely no smoke or soot was formed and at the end of the test the inside surfaces of the boiler were chalky white.

The burner fuel unit was then disassembled and found full of dirt consisting of sand, carbon, steel chips and sludge. Even under this extreme condition the burner operated perfectly and the nozzle was found clean and unobstructed.

THE WINKLER Econo-Flame

A radically improved design in high pressure burners. Features the Defecto-Air principle—maintains correct mixture of oil and air for complete combustion—ends sooty, uneven firing and noisy operation.



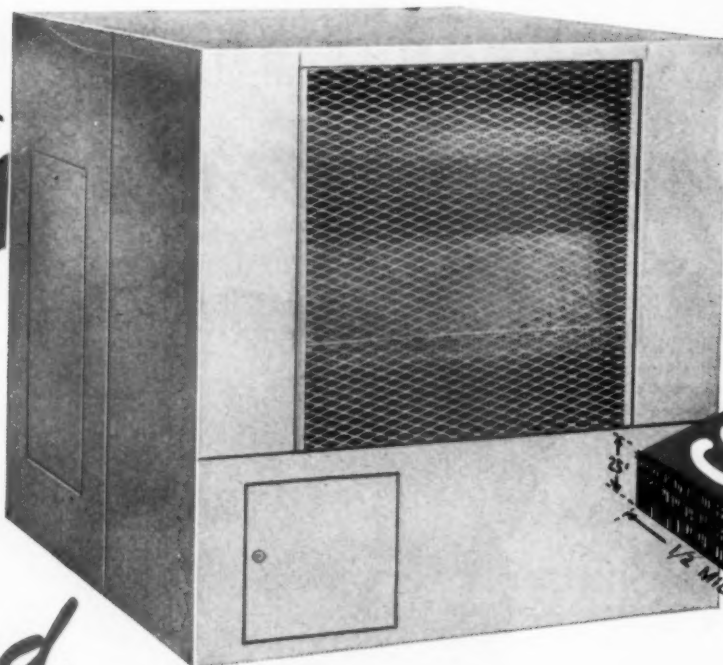
WINKLER

Automatic Heating Equipment

U. S. MACHINE CORPORATION, Dept. AN-6, Lebanon, Indiana



Comfort Air Washer
No. 50-W—Capacity
5000 c.f.m.



COOL, SERVICE-FREE COM-
FORT... FOR THE COMFORT
AIR WASHER DEALER, TOO



Greater cooled-air volume, sustained
season after season—at lowest final cost.

Lead WITH THE Leader

Comfort Air Washers supply up to three times as much properly cooled air as ordinary coolers of similar rating... season after season, without let-down in volume or cooling efficiency... fresh air, thoroughly washed and cooled—at final costs that are much lower.



Sensational New Plug-in Window-type Comfort Cooler with manual-fill reservoir and water pump.

The complete COMFORT line covers all residential and commercial-industrial-institutional installations, including this manual-fill, self-pumping, plug-in window-type cooler for instant installations beyond water mains.

Comfort Air Washers and Coolers are mass-produced for economy in cost and pricing. Easy and convenient to install... nationally known and powerfully advertised, with an intensive program of dealer sales cooperation and generous profits to the trade.

Lead with the leader. Sell satisfaction—enjoy freedom from hot-weather service trouble. Write for the complete fact story of the Comfort 4-Way Air Washer and franchise opportunities in your section.

Comfort Products Corporation

2220 Lamesa

Dallas 2, Texas

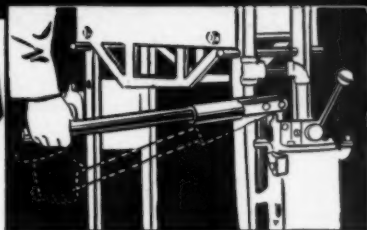
BETTER IN 8 BASIC WAYS

1. Full-rated, generous Air Capacity, permanently maintained... no deterioration in capacity.
2. Pre-washing of Air Supply—ahead of the filters... avoids clogging of filter mats and maintains cooling capacity.
3. Ten-fold, unfailing Water Supply... with the unique "Water Flinger"... for maximum evaporation and cooling effect.
4. Filter Pads "Stair-stepped"... giving 33 1/3% more filtering and evaporative effect.
5. Non-organic Fiberglass Filtering Units—avoiding growth of algae and fungi.
6. Humidity reduced and controlled by the Comfort Baffle Filter.
7. A pleasant breeze—not a noisy draft... due to oversize Turbine Blower turning at "loafing" speed.
8. Soundly designed and adequate Duct Systems... for best cooled air distribution.

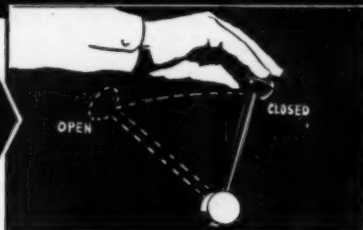
Comfort 4-Way Air Washer
CHANGES • WASHES • FILTERS • COOLS •



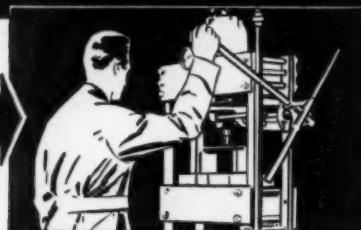
These **KRW** Hydraulic Arbor Press Features



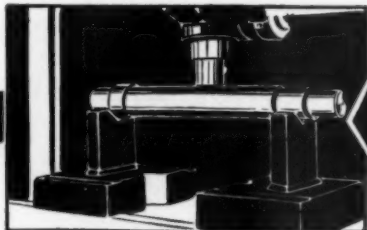
Fast Action, cylinder is filled as ram travels to work. You get tons of pressure with first pump stroke.



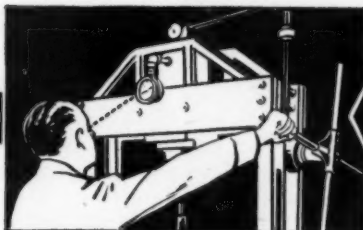
Finger Tip Control opens and closes valve in a jiffy. No gripping effort assures easier, faster operation.



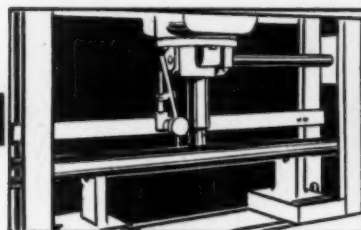
KRW Built-in Mechanical Press permits up to 3 tons pressure for straightening small diameter work.



One Piece, All Steel V-Blocks have machined surfaces for greater accuracy; usable upright or inverted.

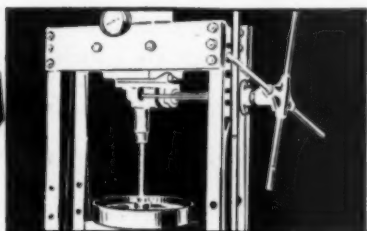


Highly Visible Pressure Gauges are mounted where they can be quickly checked. Read in tons and pounds.

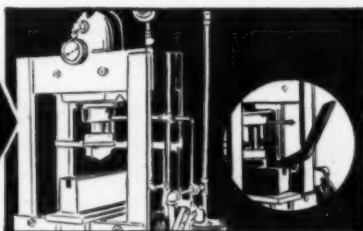


Micrometer Dial Attachment permits great accuracy in checking work without removing from V-block.

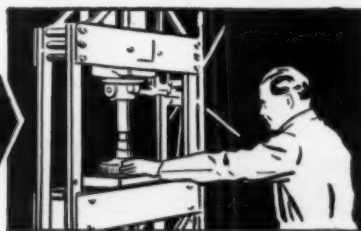
Reduce Costs ON THESE AND OTHER DAILY Production Jobs...



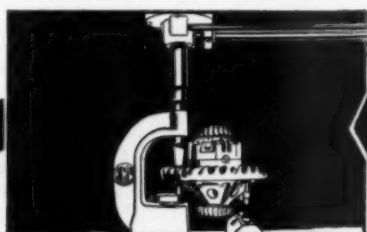
Broaching a key way in a flywheel. 7½ inch ram travel makes many broaching jobs practical on KRW Presses.



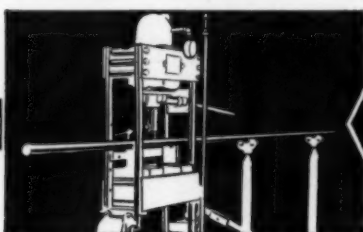
Bending in production lots with simple, inexpensive dies is easily done on low-cost KRW Hand-operated Presses.



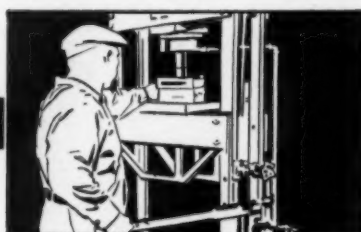
Pressing of all types is efficiently handled. Adjustable bed makes pressing on long shafts a very simple operation.



Riveting with KRW Riveting Attachment is simplicity itself. Many KRW Presses are used for this type work.



Straightening, especially on long work, is easy on a KRW Press because of its special open-end construction.



Blanking is easy with simple die set for short-run operations. Releases regular equipment for quantity production.

Write for the
**NEW
KRW
Catalog.....**



K. R. WILSON, 215-217 Main St., Buffalo 3, N.

Please mail me a copy of your
Hydraulic Arbor Press Catalog

Name

Address

City Zone State

K·R·WILSON

215 MAIN STREET, BUFFALO 3, N. Y.

Be Prepared for any Fuel Emergency



*Rybolt Series 152
Cast Iron, Coal-Fired Winter Air Conditioner.*



*Rybolt Series RH-76
Steel Coal-Fired Winter Air Conditioner.*

RYBOLT Coal-Fired Units are Easily Converted to Firing with Gas or Oil, with Little or No Loss of Heating Efficiency

Rybolt coal-fired units, cast iron or steel, can easily and quickly be converted to firing with gas or oil, then back again to coal firing if emergency demands. This is a big selling advantage that gives you real protection in case of fuel shortages.

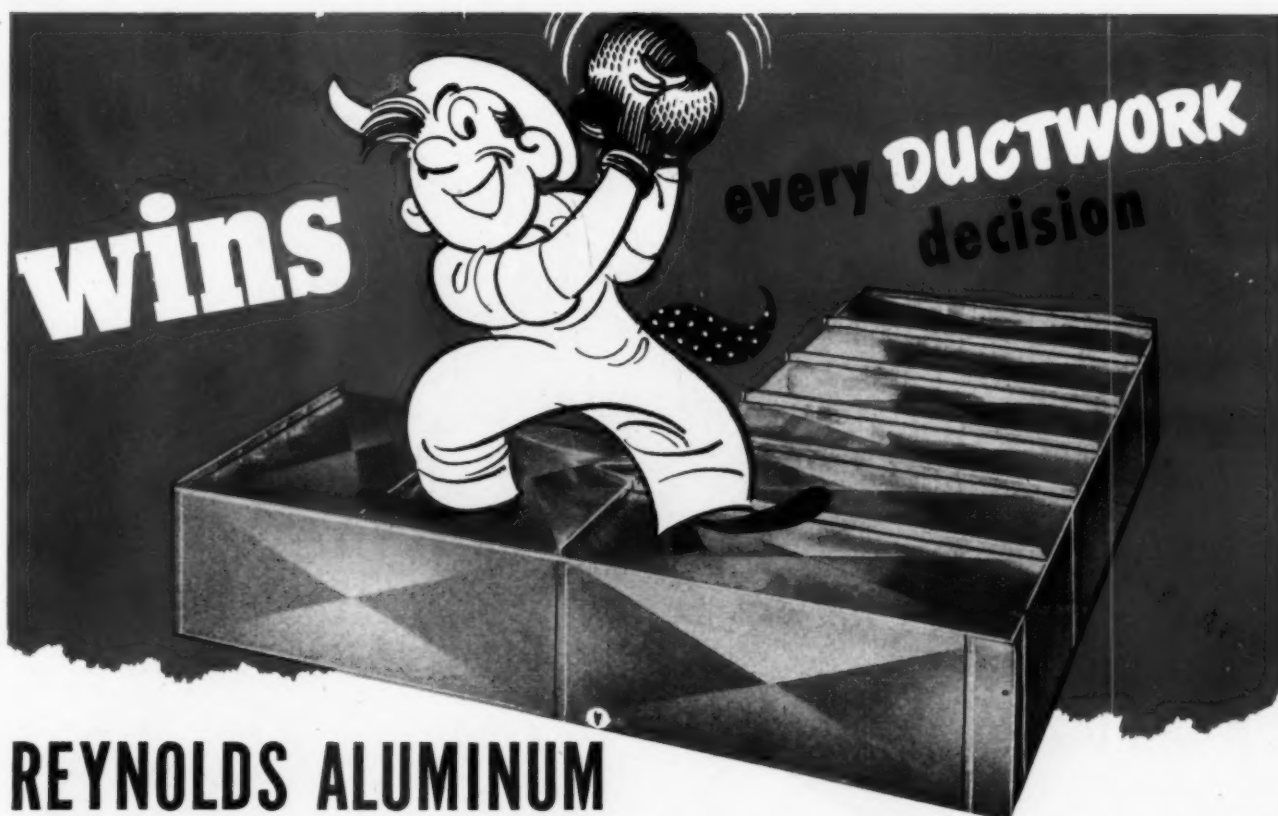
And these conversions can be made with little or no loss in heating efficiency. Rybolt units are correctly designed to burn all fuels efficiently because ample combustion space and adequate heating surfaces are provided.

The units illustrated at left, Rybolt Series 152 and RH-76, primarily designed for hand firing, can also be adapted for stoker firing—another example of their versatility and adaptability to meet every requirement.

For utmost fuel protection, convenience, efficiency and economy, urge your customers to install Rybolt coal-fired heating units.



THE RYBOLT HEATER COMPANY
615 MILLER STREET ★ ASHLAND, OHIO



REYNOLDS ALUMINUM

Faster Fabricating • Three times more metal in every pound • Less Labor • More Attractive Finish • No Painting • Greater Customer Satisfaction

In the fight for more profitable business, sheet metal men know that Reynolds Aluminum for duct work is the new champion. This lightweight sensation handles heavy assignments in heating and ventilating work with ease. See how Reynolds Utility Sheet takes points for these important advantages:



COST In line with other metals, $\frac{1}{3}$ the weight so there's 3 times the working metal per pound.

FINISH No rust and so there's no need to paint or coat the metal surface.

SPEED Jobs get completed faster. Larger sections can be shop-fabricated and trucked to job site. Less labor required per installation.

HANDLING Easier to handle in fabricating and installing. Regular tools, Pittsburgh Lock Seam, shears, etc., do the job with less tool wear.

CUSTOMER APPEAL You can't top aluminum for all 'round satisfaction. Lifetime service, sound-deadening and efficiency qualities make the installation more attractive to the buyer.

Score a knock-out against competition. If you haven't found out the definite advantages with aluminum for heating and ventilating jobs, get complete information.

WRITE! For your free copy of our illustrated booklet send to Reynolds Metals Company, 2034 South Third Street, Louisville 1, Ky.



REYNOLDS
Lifetime **ALUMINUM**

REYNOLDS MADE ALUMINUM COMPETITIVE — TAKE ADVANTAGE OF IT

FOR EFFECTIVE CONTROL THAT MEANS EFFICIENT OPERATION

RECOMMEND *and*
INSTALL



PLIAVANE REGISTERS

NO. 42

Trim, attractively designed PLIAVANE Registers harmonize with any home... provide even air distribution with uniform velocity over the entire face. Noise is eliminated, resistance reduced, and the use of smaller sizes is permitted.

Back blades may be readily adjusted to direct the air stream 20° upward, 20° downward, or straight. Face bars are individually adjustable for horizontal deflection. Available for sidewall or baseboard installation in sizes from 6x4 to 14x8, with intakes to match supply registers.

Be sure of performance... be sure of customer satisfaction... recommend and install Tuttle & Bailey PLIAVANE Registers.

TUTTLE & BAILEY INC.

NEW BRITAIN, CONNECTICUT

AMERICAN ARTISAN, April, 1948



blow hot
blow cold



... and power your fan with a



UNIT BEARING MOTOR

Available in QUANTITY Now!

The one-piece aluminum, die-cast rotor and totally enclosed construction of these motors assure dependable, service-free operation.

Bearings are positively lubricated—need no oiling during the life of the motor. Following the shaded-pole type electrical design, these motors have the low starting torque characteristics especially suited to smooth acceleration.

For details on output ratings and frame sizes, write for GEA-4711. Address: *Apparatus Dept., General Electric Company, Schenectady, New York.*

OTHER APPLICATIONS

Unit Bearing Motors are also used on a miscellany of equipments—pumps, ironers, agitators, animated displays and ticker tapes. Here is an inexpensive, quality motor that can be installed and forgotten. Check your motor needs—the Unit Bearing Motor may be just what you're looking for.

GENERAL ELECTRIC

100,000,000

printed impressions in 1948

pre-sell Bryant products

FOR YOU!



● Smashing, colorful Bryant advertisements are appearing in eight leading national magazines.

The sales punch of Bryant's powerful advertising campaign is driving home the Bryant sales story to millions of buyers... *to your prospects!*

THESE PLUS ADVANTAGES ALSO ARE YOURS IF YOU SELL BRYANT EQUIPMENT

COMPLETE LINE—Heating equipment for all types of residential, commercial and industrial buildings.

PROMPT DELIVERY—Bryant warehouses in 48 cities supply equipment or parts without delay.

BETTER DESIGNED EQUIPMENT—Bryant is ahead of the field with the latest, best engineered heating equipment... backed by 40 years of experience.

NEW SELLING AIDS—Dealer helps, including sales literature, window displays, floor displays, newspaper advertisement mats, and many others.

SALES TRAINING—Pre-tested methods and materials for training sales personnel. Includes training guides, sound slide films and motion pictures.

ENGINEERING HELP—Skilled heating engineers in 48 distributor cities, always ready to lend advisory assistance.


bryant
AUTOMATIC HEATING

BRYANT HEATER COMPANY • CLEVELAND, OHIO



The Alnor Velometer Jr., 4" x 3" x 1½"; available in single or double range scales; double-pivoted, double-jeweled movement for increased accuracy.

Announcing the **New Alnor Velometer Jr.!**

Here's the new Alnor Velometer Jr.—Illinois Testing Laboratories' most recent perfection in precision air velocity measurement instruments. A small, portable, completely self-contained unit, the new Velometer Jr., answers a long felt need for an accurate, instantaneous direct reading instrument that is low in cost.

Amazingly accurate . . . easy to read, this inexpensive Velometer gives direct reading of air velocity in feet per minute without bothersome timing, calculations or reference to tables and charts.

The new Velometer Jr., can be adapted to a score of uses when installing new work or maintaining efficient operation of established systems. Send for bulletin and prices!

Alnor

**PRECISION INSTRUMENTS
FOR EVERY INDUSTRY**

ILLINOIS TESTING LABORATORIES, INC.
Room 538, 420 N. La Salle Street, Chicago 10, Illinois

DRAVO
Counterflo
HEATERS
AVAILABLE
IMMEDIATELY!



NOW—Dravo *Counterflo* Heaters can be shipped promptly from stock.

NOW—The unsurpassed leader for open-space heating is available immediately.

AND—Immediate availability means that you can take advantage of the summer air-circulating feature right now. You simply flick the selector switch and the large fans instantly go to work to help maintain comfortable working conditions for employees. Even more important, you'll be prepared in advance for next heating season.

In thousands of industrial and commercial establishments you'll find Dravo *Counterflo* Heaters establishing records for efficiency and economy. They'll prove their worth to you, too, and they can be

SHIPPED IMMEDIATELY FROM STOCK for Winter Heating and Summer Ventilating.

For quick action call the Dravo Representative listed under "HEATERS" in your classified telephone directory, or contact Heating Section, Dravo Corporation, Pittsburgh 22, Pennsylvania.

Dravo also manufactures the DRAVO CRANE CAB COOLER for air conditioning hot-metal crane cabs.

DRAVO CORPORATION

PITTSBURGH • CLEVELAND • PHILADELPHIA • DETROIT • NEW YORK
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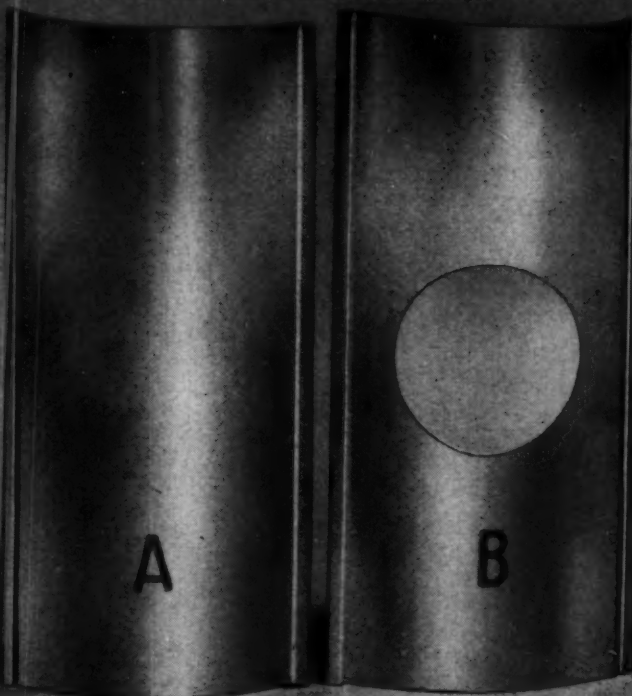
Sales Representatives in Principal Cities





... *A slick trick*

... that can make you a lot of **PROFIT** between now and November 1st!



HEAT-RESISTANT STAINLESS STEEL

PANELOX (TRADE MARK REG.)

COMBUSTION CHAMBER FOR OIL BURNERS



Light in weight—easy to handle—no breakage in shipment, handling or installation.



Interlocking seams prevent warping—add great rigidity and structural strength.



Heat-resistant stainless steel. Highest in chromium content—withstanding extreme temperatures.

- You take to the job only the size Chamber you need.
- You simply slide the interlocking edges together as you set them up inside the furnace.
- Flexible panel joints permit fitting in any size and shape of furnace.
- Set PANELOX Chamber in position with burner gun through the one panel which has opening. Allow 1½" to 2" of space between Chamber and fire pot, or wall of furnace. Do not set PANELOX Chamber in cement. Do not use backfill insulation.

**That's all there is to it—
In 15 minutes the job is done**

Your customer has the finest Stainless Steel Combustion Chamber that saves him fuel, gives instantaneous combustion, heats up in seconds, cuts down noise, eliminates smoke, soot

and oily film due to improper combustion, and provides better room temperature control.

PANELOX Chambers are made of finest heat-resistant steel, to withstand extreme temperatures, and resistant to sulphur-bearing fuel oils.

You can reap a harvest of profits during this fuel oil shortage. The months ahead can mean good profits with lower labor costs if you sell and install PANELOX—the Stainless Steel Combustion Chamber that is installed in minutes . . . heats up in seconds . . . stands up for years.

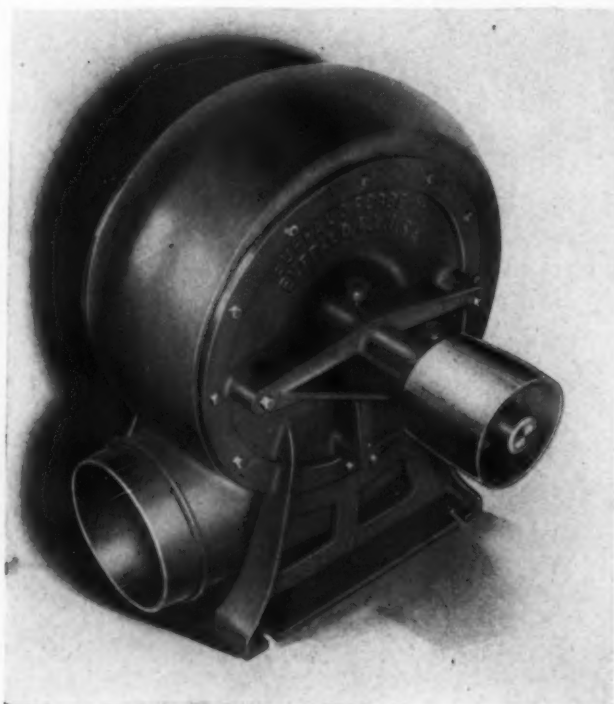
Write, wire or phone for full details and prices

STEFECO STEEL COMPANY

HEATING EQUIPMENT DIVISION • MICHIGAN CITY, INDIANA

All-around Satisfaction

with these **PROVEN FANS**



"BUFFALO" VOLUME FANS

● Highly adaptable to almost any type of installation — durable and efficient on the job — satisfying to the customer! "Buffalo" Volume Fans are readily adjustable to eight discharge positions, and reversible as to rotation. They're suitable for blowing and exhausting applications up to 10" static pressures. They're quiet running, on dust-proof ball bearings. Cast iron construction resists deterioration by heat, fumes, grit. Put your reputation out in front with "Buffalo". Write now for Bulletin 3615 and prices.

"BUFFALO" "E" BLOWERS

In a choice of constant speed and variable speed models in four sizes, these practical, husky units are ideal for industrial blowing and exhausting service where moderate quantities of air are needed against relatively low pressures (up to 3.65"). Simple, compact design makes for a very satisfactory installation in small space. Hundreds doing a low-cost, trouble-free job in industry. Write for Bulletin 3222-F now.



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COMPANY

504 BROADWAY

BUFFALO, N. Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

Branch Offices in all Principal Cities

FANS

by
"Buffalo"

EQUIPMENT FOR

- ★ VENTILATING
- ★ HEATING
- ★ COMFORT COOLING
- ★ PROCESS COOLING
- ★ AIR TEMPERING
- ★ AIR WASHING
- ★ EXHAUSTING
- ★ BLOWING
- ★ FORCED DRAFT
- ★ INDUCED DRAFT
- ★ PRESSURE BLOWING
- ★ CLEANING
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CUTTING AIR COSTS IN EVERY BRANCH OF INDUSTRY

a big jump forward
for forced warm air



INDIVIDUAL ROOM
TEMPERATURE CONTROL

Automatically

DOLE
Thermo-Matic
REGISTER

Considered as the biggest advance since automatic firing, Dole Thermo-Matic Registers will materially improve any forced warm air heating system.

They operate thermostatically from room air. Very sensitive modulating effect. Output is regulated to meet heat losses. Completely self-contained. No wires to run — no bulbs to locate — very simple to install.

Simple setting of the thermo-dial assures room temperature control — as desired — corrects many unsatisfactory heating installations. A zone control for every room.

Dole manufactures AIR and VACUUM VALVES for heating systems and WATER MIXERS for domestic use.

POST YOURSELF
on This New
Development

*Send this
Coupon Now*

THE DOLE VALVE COMPANY
1933A Carroll Avenue
Chicago 12, Illinois

Please send me facts about the new
DOLE THERMO-MATIC REGISTER
for forced warm air heating systems.

NAME (Please print) _____

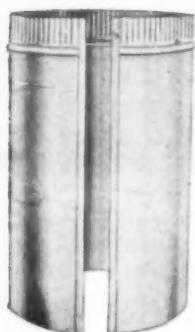
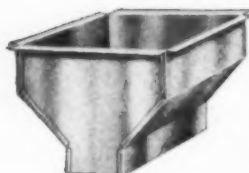
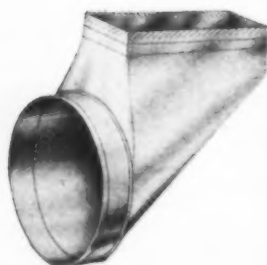
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☐ DEALER ☐ JOBBER ☐ ARCHITECT
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Showing just a few
Char-Gale fittings



CHAR-GALE ALUMINUM *Fittings*

THE ANSWER TO SUCCESSFUL
AND PROFITABLE FURNACE
INSTALLATION

Feather Light



The easiest handling fittings ever made! Cut strain and time on installations—cut transportation time and cost—cut handling time on the job.

Stronger - Longer Lasting



Rustproof clear through! Installations are stronger with aluminum—last years longer.

Better Looking



More customer satisfaction! The smooth, bright beauty of these fittings does not discolor with heat or time. Needs no painting or covering—just naturally beautiful.

And It Costs No More!

PREFABRICATED
DUCTS AND FITTINGS
FOR WARM AIR
HEATING

CHAR-GALE

MINNEAPOLIS
OMAHA

ANOTHER PRODUCT OF CHAR-GALE METAL CRAFTSMEN

"NO HEATING PLANT IS BETTER THAN ITS INSTALLATION — NO INSTALLATION CAN BE BETTER THAN ONE OF CHAR-GALE FITTINGS"

Field

BAROCHEK



SELLS Because It SAVES

Barochek, the scientific combination check damper and barometric draft control, is the profit-proved answer to the public's question, "How can I make my fuel go further?" 8,000,000 owners of hand-fired heating plants need Barochek to:

SAVE COAL • SAVE TIME • SAVE MONEY

WITHOUT BAROCHEK

HE ATE FAR TOO MUCH COAL AND



CRIED FOR ATTENTION MOST OF THE TIME.



HIS TEMPERATURE WAS DANGEROUSLY HIGH.



YES, FRANK WOULD SOON BE A PROSPECT FOR THE UNDERTAKER.



BUT THEN... DOCTOR DEALER PRESCRIBED BAROCHEK

FRANK EATS MUCH LESS COAL.



HE GOES A LONG, LONG TIME WITHOUT ATTENTION.



AND DOES A GOOD JOB WITHOUT BURNING HIMSELF UP.



NOW HE'S GOOD FOR YEARS MORE SERVICE.



Frank Furnace was a mighty sick man. He had all the symptoms of uncontrolled draftitis.

WITH BAROCHEK Frank Furnace became a new man. Barochek brought his draft under control, and now...

YOU will PROFIT with the fast-selling Field Barochek. Write or wire TODAY for descriptive literature and complete details.

FIELD CONTROL DIVISION

H. D. CONKEY & COMPANY
MENDOTA, ILLINOIS



ex-pe'ri-ence* BUILDS BETTER CRESCENT TOOLS



* "State, extent, or duration of being engaged in a particular study or work; knowledge, skill or technique resulting from experience."

— WEBSTER

● Symbolic of the vast amount of experience accumulated by Crescent workers, are hands which have increased in skill with years of doing. Owners of such hands have seen the Company grow immensely in capacity and precision production since its incorporation in 1907. Many old-timers, with service records from 20 to 40 years and more, are still active members of the Crescent staff. It is this group which helped make quality a Crescent tradition, and which

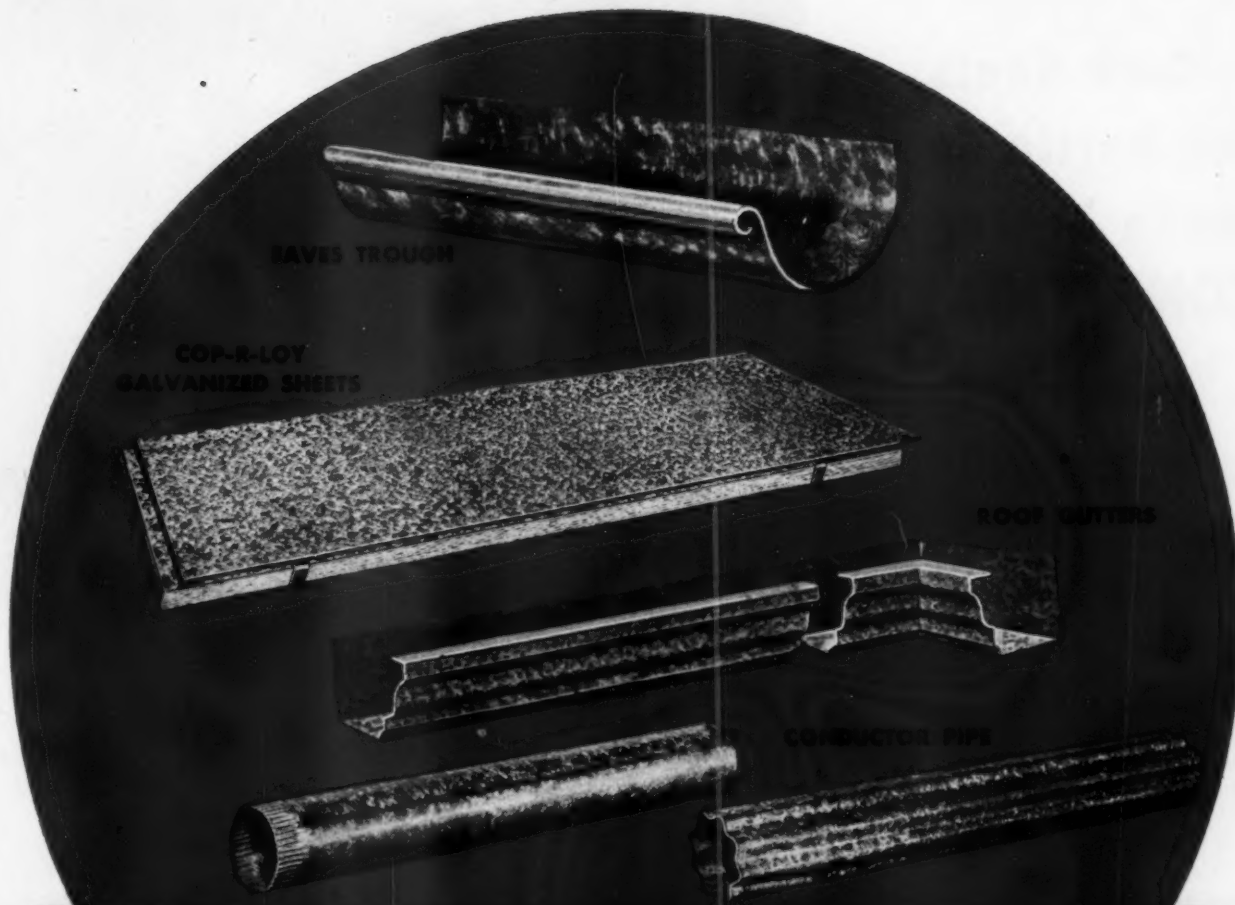
indoctrinated its younger fellow workers with the credo of "quality before quantity".

Many other members of the Company are well on their way to joining the Crescent long-service group, which comprises about 25% of the entire personnel. World-wide acceptance of Crescent Tools has been built upon the conscientious application of skill and knowledge gained through experience. When you specify "Crescent", you may be sure you are getting quality tools produced by the combined efforts, skill and experience of all Crescent employees.

CRESCENT TOOL COMPANY, Jamestown, N. Y.



* "CRESCENT" is our trade-mark registered in the United States and foreign countries for wrenches and other tools. "Crescent" tools are made only by Crescent Tool Company of Jamestown, N. Y., and are sold by leading distributors everywhere.



One job helps sell another when you sell
WHEELING COP-R-LOY PRODUCTS



GALVANIZED ROOFING



WHEELING CORRUGATING COMPANY • WHEELING, W. VA.

ATLANTA	BOSTON	BUFFALO	CHICAGO	CLEVELAND	COLUMBUS	DETROIT	KANSAS CITY
LOUISVILLE	MINNEAPOLIS	NEW ORLEANS	NEW YORK	PHILADELPHIA	PITTSBURGH	RICHMOND	ST. LOUIS

Cork Seals for Bottle Caps made better in CONDITIONED AIR

Here is another interesting industrial application of air conditioning, to improve the sealing quality of bottle crowns or caps.

Inside of each steel crown there is a cork seal that forms an air-tight closure on the lip of the bottle. This seal is made from granulated cork that is first combined with a special binder, then formed into a rod and later sliced into thin discs. Here it is important that the temperature and humidity of the surrounding air be controlled to insure the proper reaction of cork and binder.

The Crown Cork and Seal Company use conditioned air to improve this manufacturing process and protect the quality of their seals. Their Baltimore plant is equipped with a central-station system that conditions air and circulates it through ducts made from Beth-Cu-Loy copper-bearing galvanized steel sheets.

Beth-Cu-Loy sheets were selected here for the same reasons that they were chosen for ductwork in hundreds of other industrial plants. They have excellent resistance to corrosion. They are strong. They are easy to form, to cut, and to solder. And Beth-Cu-Loy galvanized steel sheets are priced at very little more than ordinary galvanized sheets.

Bethlehem Steel Company,
Bethlehem, Pa.

*On the Pacific Coast Bethlehem products are sold by
Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel
Export Corporation*

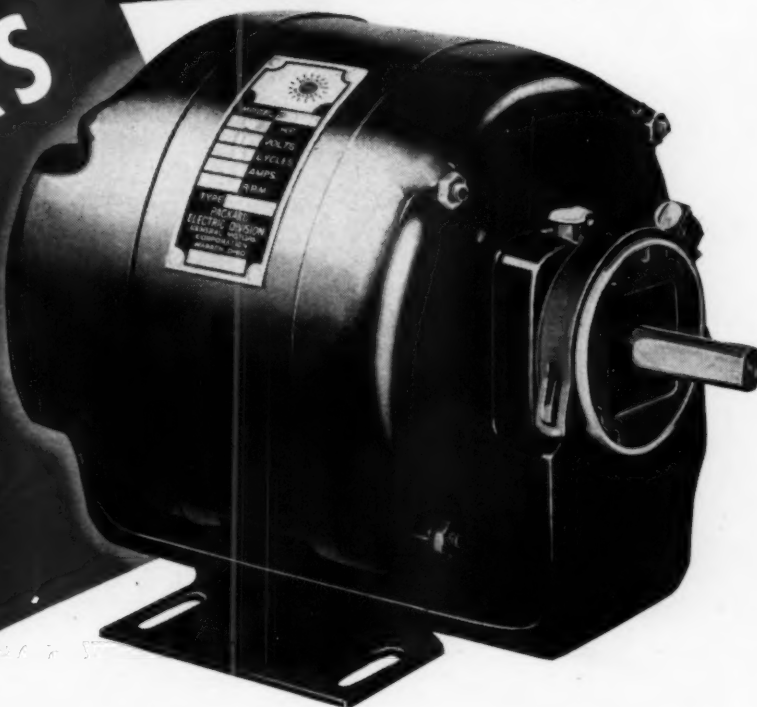


Air conditioning keeps the mixture of cork and binder at the consistency required for the molding machines in this seal manufacturing plant. The air ducts here are made from Beth-Cu-Loy Sheets.

Beth-Cu-Loy **GALVANIZED** Steel Sheets

PACKARD SUNLIGHT MOTORS

*Proved where
Performance Counts—
On the Job*



PACKARD SUNLIGHT MOTORS for

compressors
washing machines
power-driven
bench tools
ironers
milk separators
milking machines
furnace blowers
stokers
oil burners
water pumps
ventilators
and many other
applications

In millions of homes, Packard Sunlight motors have performed their job dependably, for many years, on leading makes of appliances. There's no substitute for a record like this. It tells the whole story of Packard Sunlight research, engineering and manufacturing.

Packard
REG. U.S. PAT. OFF.
TRADE MARK

Packard Electric Division, General Motors Corporation, Warren, Ohio

DEPENDABLE APPLIANCE MOTORS FOR THIRTY-TWO YEARS

CHIP, CUT, DRILL, GOUGE

with *Thor*

**PORTABLE
ELECTRIC
HAMMERS**



*Thor U-100 Hammer
with the "Sling Shot Drive"*



Thor offers a full selection of hammer tools for working with wood, brick, stone, metal composition and other materials.

1600 power-packed blows per minute with Thor Hammers save time and money on hundreds of construction, maintenance and repair jobs. Use them in working stone, concrete, wood, metal and other materials—drilling, channeling, cutting, gouging, chipping, scaling, etc. *Thor's famous "Sling Shot Drive" puts more wallop into every blow. YOU PROFIT BY LOWER JOB COSTS.* Let a demonstration show how. *Your nearby Thor distributor will gladly arrange one at your convenience.*

INDEPENDENT PNEUMATIC TOOL COMPANY

Aurora, Illinois

Export Division: 330 West 42nd St., New York 18, N. Y.

Birmingham	Boston	Buffalo	Chicago	Cincinnati	Cleveland	Denver	Detroit	Houston
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Thor

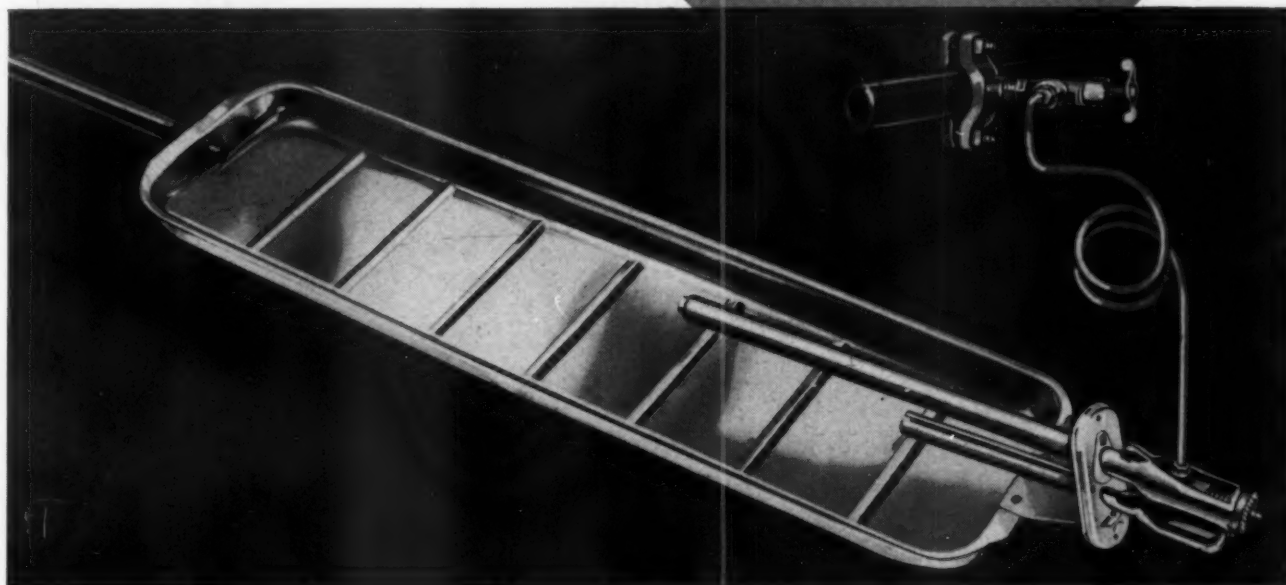
PORTABLE POWER

TOOLS

PNEUMATIC TOOLS • UNIVERSAL AND HIGH FREQUENCY ELECTRIC TOOLS • MINING AND CONTRACTORS TOOLS

*The Greatest
Name In
Humidifiers*

**THERMO-
DRIP**



PEAK EFFICIENCY AT LOWEST COST

Thermo-Drip Humidifiers are first choice with furnace men the nation over... economical—efficient—durable—they give perfect balance of humidity and temperature at all times.

BI-METAL THERMOSTAT

Compact—no complicated parts—sturdy—gives years of trouble-free service. Requires no additional adjusting after installation.

STAINLESS-STEEL PANS

Long lasting—cannot rust or corrode—heat quicker—cause faster evaporation—give larger evaporating surface. Tailored to meet every humidifying need.

EASY INSTALLATION

Quickly attaches to any type or make of furnace. Manufactured for tailored fitting. All accessories included—nothing extra to buy.

Write today for complete catalogue, including prices and deliveries.

DEPT. A-448

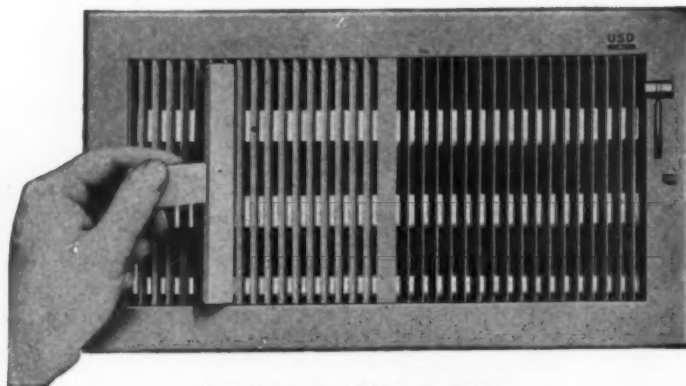
Automatic Humidifier Co.
CEDAR FALLS, IOWA



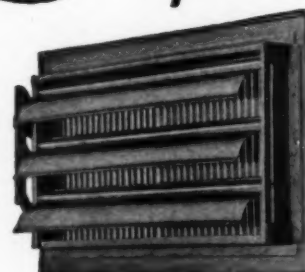
Auer 4-WAY AIRO-FLEX

"4400" Series Registers

*Adjustable for
Right or Left
-also Up or Down
Directional
Flow*



No. 4432 Airo-Flex Adjustable Register



Back view of Airo-Flex
No. 4432 Register

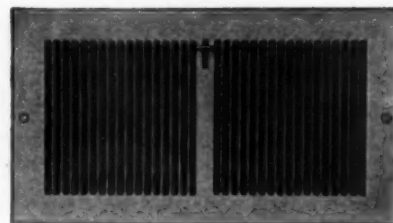


The Auer Airo-Flex "4400" Series gives you a really fine quality register, nicely made, smoothly operating, 4-way directional—yet very moderately priced. By keeping the entire design and the working mechanism as simple as possible, but sacrificing no essential, we have held the cost on this model to a figure which makes it very popular. This Airo-Flex has horizontal multi-louvre deflecting blades governing up-and-down flow. Indicator on face shows setting of these blades. Vertical fins on face are also easily adjusted to desired right or left angles, with turning tool.

In both appearance and efficiency, this is an outstanding value in a 4-way register and a product you can use with pride on *any* job. The same design face is also available in the "4000" line, with single valve, for right or left flow, as shown below.

Auer makes a complete line of high grade registers for all your gravity or air conditioning needs. Auer Register Book (or special Catalog "G" on flat stamped metal Grilles) mailed on request.

No. 4032



The Auer Register Company, 3608 Payne Avenue, Cleveland 14, Ohio

Auer **REGISTERS**
& GRILLES for AIR CONDITIONING & GRAVITY

The New

VICTOR

WITH REVERSIBLE BLOWER COMPARTMENT

*Ideally Constructed
for CONVERSION*
from COAL to OIL or GAS with
practically no loss in efficiency

The ultimate in streamlined beauty has been added to the exclusive features of design and construction which have made the name VICTOR synonymous with quality for 58 years. The 1948 VICTOR line... with heat radiating *FINS*... now, more than ever, takes you out of the competitive class.



WRITE US ABOUT COMPLETE VICTOR LINE
COAL, GAS & OIL FURNACES—OIL BURNERS—STOKERS—BLOWERS—ACCESSORIES

HALL-NEAL FURNACE Co.

VICTOR Quality Furnaces Since 1890

1322 N. CAPITOL AVENUE — INDIANAPOLIS 7, INDIANA



Use Stainless Steel to Increase Your Business

Get it Quickly from Ryerson Stocks

Have you considered stainless steel for sheet metal jobs that call for brightness and long service under tough conditions? You can easily try it because Ryerson stocks of Allegheny stainless are as near as your telephone and we are just as pleased to furnish a single piece for experimental work as a large shipment for regular production.

You'll be pleased with the way Allegheny stainless sheets help you maintain your reputation for good work well done. You'll like their workability. Fabrication is reasonably easy with regular equipment and standard techniques. And your customers will like the low maintenance cost of Allegheny stainless. The mirror-like finish resists corrosion and cleans readily, bright-as-new.

Ryerson engineers will make certain you get the

right type of Allegheny stainless for every job. They're stainless steel specialists whose advice is backed by more than 20 years of Ryerson experience in working with this precious metal of industry.

Call our nearest plant today for prompt delivery. Joseph T. Ryerson & Son, Inc. Steel-Service Plants at: New York, Boston, Philadelphia, Detroit, Cincinnati, Cleveland, Pittsburgh, Buffalo, Chicago, Milwaukee, St. Louis, Los Angeles.

We would be glad to send you the current Stainless Steel Stock List, showing sizes actually on hand in the following stainless products:

Sheets	Hexagons	Angles	Pipe Fittings
Plates	Squares	Pipe	Welding Electrodes
Rounds	Flats	Tubing	Fastenings

RYERSON STEEL

AMERICAN ARTISAN

RESIDENTIAL
AIR CONDITIONING
WARM AIR HEATING
SHEET METAL CONTRACTING

Labor Management Relations Act

ONE of the most fundamental changes in labor relations in the construction industry may be anticipated from the provision in the Labor Management Relations Act which prohibits discrimination or closed shop agreements. Many heating and sheet metal contractors have not been fully aware of this coming change in labor relations because current closed shop agreements have been permitted to continue in effect until their termination, renewal, or extension date, or until one year after the effective date of LMRA (August 22, 1947), whichever occurs first. The new law prohibits employers and unions from entering into closed shop agreements. Such agreements are discriminatory and come within the definition of an unfair labor practice. Also, union shop agreements are illegal unless a majority of the employees eligible to vote authorize such a contract in an election held for that purpose. The National Labor Relations Board alone is authorized to conduct elections to determine whether or not employees wish to authorize their union to seek a union shop agreement.

The problem of holding elections in the construction industry is not a simple one. Business units are often small and scattered across the country. In many cases the period of employment varies considerably, sometimes from job to job. Space does not permit giving all the details of the plans being developed for holding elections in the construction industry, however, a pattern is being developed from surveys and pilot elections in several geographical areas. When established, the procedure will become the pattern throughout the industry.

This means that contractors will be confronted with a problem of procedure because union agreements are now coming up for renewal, at a time when the procedure has not been established.

Recognizing this problem, Robert N. Denham, General Counsel of the Board, recently stated that it was entirely legal for an employer and a union to include in a collective bargaining agreement, a union shop provision to become effective *only* in the event the Board certifies, after an election held for that purpose, that a majority of the employees eligible to vote have authorized such a provision.

This does not permit employers to renew closed shop agreements during the interim period. The legislative history of the Act discloses an intent on the part of Congress to guarantee the right of employees to engage or refuse to engage in union activities. This was done by prohibiting employers from entering into agreements which would require union membership before an applicant is hired. The right to refuse to engage in union activities is qualified only in those cases where a certified union shop agreement exists, and then only to the extent that union membership is required after 30 days of employment.

Ban on Closed Shop

Congress sought to prohibit the abuses that arose under the closed shop permitted under the old Wagner Act. On this the Senate Committee Report is quite clear:

"... We have felt that on the record before us the abuses of the system have become too serious and numerous to justify permitting the present law to remain unchanged. It is clear that the closed shop which requires pre-existing union membership as a condition of obtaining employment creates too great a barrier to free employment to be longer tolerated."

On the other hand, Congress deemed it unfair to allow a small group in any shop to enjoy the advantages of collective bargaining without contributing to the maintenance of the bargaining union. So the prohibition against discrimination was qualified by permitting an employer and a union to agree that every new employee in the unit must join the union after 30 days, provided a majority of the employees affected have voted in favor of the union shop by secret ballot in an election conducted by the Board.

Requirements for Union Shop

A union shop agreement is not established solely by the employer and the union. Several conditions must first be fulfilled and the fulfillment of these conditions creates problems of procedure which must be solved before the agreement can be established.

First, the union must be certified by the Board. This
(Please turn to page 190)

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Arnold Kruckman's

Washington Letter

★ ★ ★ ★ ★ ★ ★ ★ ★ ★



Clash of Ideologies

HERE in Washington we are not quite sure that anybody, in Government or out, understands the moves that are being made by Stalin and Company. It is a week past the President's really very fine speech to the Joint Session of Congress. In content and in form this message is generally considered as the finest utterance of his Administration. It was unmistakably sincere, and it was careful, high in its objective, yet definitely purposeful. The tragic aspect was that Mr. Truman was limited by the lack of his own qualities. If your mind was not obsessed by prejudice you felt entirely friendly to him while he spoke, but at the same time you were unhappily conscious that he did not have that intangible thing which, for want of a better word, we call magnetism. It is something that enables a great leader to project an inspiration over and into a listening audience. It sweeps them along almost despite themselves. FDR had it. Some one said after the President left the podium that if FDR had made the mobilization speech the men and women on both sides of the aisles would have risen and cheered wildly. But even as the President spoke one was distressedly aware that the Republicans, and the ultra-radicals, "sat on their hands" in the argot of the stage. The applause was strictly partisan. This reaction extended even to the visitors' galleries, which were packed by women, who outnumbered the men at least 8 to 2. Their presence, and their lukewarmness, was not due to the opposition of women to war and the draft—polls show they are decisively for Universal Military Training—but it sprang from the fact that most of the visitors came with cards from the Republican members of the Congress. The lack of applause from the galleries was notable.

Balkan Danger Again

You may or you may not agree with the President's policies; but there is no remote doubt that we are up against an international crisis. As this is written we are waiting to see if Stalin will launch the attack on

Greece by way of those three Yugoslav divisions poised on the borders to strike. The grapevine says that they are to invade Greece before April 1. The Bulgarians, another tool of Stalin's, are assumed to be ready to attack the Turks. Both Turks and Bulgarians have sent back to their homelands their respective diplomatic officials. Should the anticipated attack really occur, our military friends here say *This Is It*. We have no troops, perhaps happily, that can get into this particular fracas. Our troops are in Germany. But those troops are occupation soldiers, not fighting troops. There are 40,000 of them. How many civilians we have scattered around troublous Europe, only a few people in the State Department probably know. They issue the validating documents. There has been some talk about a plan to draw our own people out of Europe, on the theory, probably, that it would be wise to forestall remote eventualities.

Activity in Capital

The possibility, *not probability*, of hostilities, has been reflected in various activities here besides Mr. Truman's measured speech. The U. S. Maritime Commission, for instance, has found it impossible to induce the Russians to return the ships they agreed to surrender at the end of hostilities. The Russians simply say they can't do so because the ships are on the high seas. The ships apparently never make port. The U. S. Maritime Commission lately has set to work to expand its organization, again. It is significant when you go to the Navy Building across the Potomac in Virginia you are politely but firmly stopped by a guard who tells you only those who have business, and can identify themselves, will be admitted. Over in the Pentagon the Military Intelligence Division—G2—works completely around the clock, and no one is permitted in the large section of the building in which it is housed unless he or she carries a badge with an identifying photograph. In the downtown hotels you feel as though the hectic days of war were back. You see many

Colonels in uniform with the inevitable brief cases, dashing in and out; and there are suddenly large numbers of Red Cross lassies in the corridors of the hotels and Government buildings.

The general idea seems to be that we are getting ready for things, rather than that we expect an immediate conflict. What is happening in Europe, and what may happen in Asia, is assumed to be calculated to make us dwindle in international esteem, rather than actual war. We are told we are not ready for anything like war, that the Russians have the atom bomb, or its essence; that they have a terrible substance called death dust, and that they have 100 divisions of highly trained troops where we have two or three. They are said to outnumber us in the possession of highly desirable jet planes by 7 to 2.

Censorship Approaches

They even are reported to have a jet bomber, a unit equipped with this highly desirable military facility, while we are supposed to have none. This is common talk in Washington, so it is not harmful to the national security to discuss it in print, even though the National Defense people wish to establish a censorship now. They have had conferences with the newspaper, periodical, radio, and photographic correspondents to arrange what would euphemistically be called a voluntary censorship. They think too much technical information has leaked into print. Some one in the Pentagon group said the other day that often when the military wish to learn the latest news about the most obscure technical and scientific developments they read the science news of the highly efficient N. Y. Times. You even hear that it is not improbable the friendly observers of foreign nations, whom in time of war we call spies, usually get the real facts about things we wish to keep deep under wraps, even before some of the brass of the armed forces get them. A censorship therefore would appear to be chiefly a hardship imposed upon our own channels of public information; and it would be mostly a hardship upon trade and business papers, which are most directly concerned with the kind of information which would be of value to the people of industry who have a dollars and cents interest in the data. There is no remote doubt that every interest and every individual American, who has common sense, will use judgment in retelling the news, and will cooperate in every way in suppressing vital facts whose revelation would harm our own cause. It is the ineptness of bureaucratic control over the release of information that raises the hackles of those whose business it is to bring you information.

Russian Weaknesses

If we actually get into war, by way of the challenge in Greece or Turkey, it is not supposed that it is intended we should. The Russians are presumed to think that we might not actually engage in hostilities if no hostilities are offered to us directly. Our military have urged the President's mobilization fervently with the argument that we are not capable of opposing the Russians properly in Europe or elsewhere with ground troops or air troops. It is assumed the intent is to push us out of Europe, and to make us look futile. Those

who know, tell us the Russians today have just about as much useable acreage to support their 192 million people as we use for a 50 million segment of our people. Like China, it is reported to be permanently a starvation land. They tell us its population is primarily and overwhelmingly Asiatic, and that its technical and mechanical economy is weakened by the fundamental differences in the ability of Asiatic manpower compared to Western Europeans in handling tools and machinery. It is denied Russia has unlimited natural wealth despite her vast expanse. Russia lags behind us at least 30 years in oil; it is 35 years back of us in coal and it lags in raw materials. They say it is very deficient in rubber, does not have the overseas transportation to be certain of its supply, and is woefully inadequate in all transport. The roads are few and very poor. She has not developed inland waterways; over 90% of her freight must go by rail, but she has less than 25% of the total railroad mileage we have, and is capable of building very limited new rail facilities. One of our most acute observers, who knows his Russia, and who has made a telling survey, says it is still in the horse-and-buggy stage, such as described us in the last century. Her automobiles are reported to be at least 9 years behind us. It is typical that Russia employs 480 persons to do a job which is done by 50 over here. She still digs coal by hand, while we cut at least 90% of our bituminous supply by machines. She has the most unwieldy bureaucracy in the world; her production in industry and agriculture is estimated to be less than half as great as ours, per man. There are said to be fewer trained people in all of Russia than we have in one state. Most of her farming is done by collective works on Government land. The economy she is presently avowedly aiming at, because she can't for the time aim at anything better, is smaller than ours was 50 years ago. She is apparently overwhelmingly weak in her comparatively low and uncoordinated industrial organization, her lack of transport, her lack of trained technicians and mechanical workers, and the comparative hunger of the mass of her people. It has been estimated, in this rich country of ours, we could do without 50% of the things we buy. The Russians, as a mass, need everything they can buy when they can buy it.

Russian Strength

The Russians are strong in troops, ground forces, navy, air forces and other military man—and woman—power. She is known to have 4,500,000 trained troops, and it is known she has a huge mass of irregular and guerrilla groups, well trained. She has a vast reservoir of fighting units, constituting the toughest of "all major races of Asia and Europe." Also she has the potential bulk of manpower and—in Czechoslovakia—a potential of a higher type of industrial organization, among the European peoples she has subjugated. But she has not yet created the organized economy to back up her human machine. Presumably her ordnance is good. Military men, past and present, are convinced it is almost impossible successfully to invade her. Her great defensive strength is her geographical location, the vast area of Europe and Asia, which sprawls over

(Please turn to page 164)

How to Cultivate TOMORROW'S CUSTOMERS



BETTY LEE GOUGH
New Orleans, La.

When the "Teen-Ager" Becomes
the Customer Will He Come
to You for His Heating Needs?
Here's How to Make Sure He Does.



EVERY Thursday afternoon, *The Item*, one of the two evening newspapers of New Orleans, La., carries a full page advertisement run by D. H. Holmes Co., a Crescent City department store. The page consists of a column written by a high school student about high schoolers, and several blurbs about outstanding students in the city's several prep schools.

In this, there is a lesson for contractors in the warm air heating field: it's good business to cultivate the 'teen-ager. Teen-agers do not buy your work, but they exert an influence on the buying of their parents. More important, they are the customers of tomorrow.

No contractor who thinks of his future business can afford to neglect the important 'teen-age group. In fact, some contractors, along with national manufacturers, department stores, and all kinds of businesses that depend upon the consumer's dollar, are finding that it pays heavily to cultivate the 'teen-age boys and girls—both in immediate volume and in the good will of a group whose spending power will be felt in the near future.

Influence Their Buying Habits

The teen-agers are the customers of tomorrow but the time to sell them is *today*, while their buying habits and preferences have not yet set. By instituting a positive program for cultivating these future customers, you can see that those buying habits, when they do set, become set in your favor.

Many heating contractors who have gone all out to cultivate the 'teen-age boys and girls have found that it pays off in immediate business in addition to laying the foundation for future prosperity. This is because 'teen-agers exert a strong influence on the buying

preferences of the big purchasing block of today—their parents. What Johnny or Jane want is taken more and more into consideration as Johnny and Jane grow older. And what Johnny and Jane want badly, they often get, as any parent of a 'teen-age boy or girl can testify.

What can be done to sell this important group?

Selling the youth market might be broken down into two phases. The first, not-so-oddly, is things *not* to do. The second is steps for wrapping 'teen-age appeal into your sales promotion and advertising.

What *not* to do is the first step in a youth-relations program for the obvious reason that many contractors not only ignore the 'teen-age market, but actively antagonize it. Forgetting the present and future importance of 'teen-age preferences, these contractors see only the fact that boys and girls buy very little out of their own pockets, and that they demand twice as much attention, and require twice as much trouble, as the grown-up customer who knows what he wants.

Before taking constructive, positive steps, it is necessary to erase this sort of attitude. What the boss thinks soon spreads to his employees. So if the boss believes that 'teen-agers are a nuisance and that they clutter up his operations, the chances are his employees know his opinion—and govern their own attitude toward the young future customers in accordance with what the boss either encourages or permits.

Your own thinking about the 'teen-age customer must be changed and, with it, your personal attitude. Have a smile for the 'teen-agers. A real smile, one you genuinely mean. A smile that says, "I like you, sonny. I'm glad to see you."

Then, the employees should be put on the youth-selling ball. Let them realize that you want a smile, a welcome, and abundant courtesy for 'teen-agers. Tell them to forget the fact that he does not pay the bill and concentrate on the fact that he is a first-class prospect for year after next.

After you have taken care of the possible errors of omission, next consider how you can work 'teen-age appeal into your advertising and sales promotion efforts. Here are some tested ideas that have proven worth-while all over the country:

One Southern firm has long sponsored an early morning radio broadcast. It is a disc jockey program, featuring recorded music, a few gags, and a news commentator spot.

The owner of this heating company wondered. Could an appeal to boys and girls be worked into this sort of advertising without boring the older customers at the same time that it interested younger listeners?

Junior Jockey!

Finally, he hit upon an idea. Now, his program format has been changed. For five days each week, it is pretty much the same as always. But on Saturdays, the time has been shifted to early afternoon. The disc jockey idea has been retained. But there is a different jockey handling the platter turnings and the in-between chatter. This one is a nineteen year old girl who makes up whatever she might lack in the way of professional finesse with youthful exuberance and an authentic knowledge of what her fellow 'teen-agers want to hear. She speaks their language, so that her commercials come right in on the selling beam.

The sponsor reports that the program's acceptance among younger members of the community and nearby area is higher than ever since inauguration of the 'teen-age disc jockey idea.

Another contractor concentrated on furnishing news of their own sphere to his community's boys and girls.

His idea was something like the page advertisements used by D. H. Holmes Co. in New Orleans, but it cost considerably less to produce and to run.

Reasoning that the 'teen-age boys and girls had no true news medium of their own outside of their school newspaper, he approached the editor of his local newspaper. Could he arrange to secure the news of 'teen-age clubs and school activities that was often crowded out of the news columns due to lack of space or interest? The editor assented. Next, this contractor talked to a reporter and for a small weekly fee hired him to write news-style accounts of youthful activities. The "stories" were run in paid space once every week, and headlined "*What They Are Doing.*"

An Idea Clicks

The ads soon drew one of the widest reader—both 'teen-age and adult—followings of any section in the paper. Advertising-wise, this heating and air conditioning contractor ran his news insertion in the same spot, on the same day of every week so that it soon became a regular feature of the paper.

The pay-off to this idea was that as soon as *What They Are Doing* had begun to interest readers, the reporter who had been hired to edit the advertised column was flooded with unsolicited news items, gossip and material sent in by his readers. Today, his job is to pick and choose what will run rather than to find it. The number of letters sent in with news is a sure indication to the contractor who sponsors this advertised news column that his selling effort is meeting with a great deal of success.

Another heating contractor who is located in the middle west makes it his business to know about dances, school plays and other activities of his town's boys and girls. Every entrance prize, award or giveaway at these events is donated by his company. For this he gets an announcement of the donor's identity and public thanks.

One sure-fire way to make your firm a 'teen-age center is to hire 'teen-agers to work for you. One contractor who did this with success reports that his youthful salesman racked up a record almost as good as those of his veteran sales force.

SWITCH THE RED LIGHT on Credits and Collections

Arthur Roberts
Pompton Lakes, N. J.

ONE requisite to efficient business management is the intelligent appraisal of internal records in order to earn maximum profit and keep financially sound. However, it is also important to extend the eye toward external factors that may affect internal business operation so that one can prepare for eventualities that may come to pass as the result of influences outside the scope of managerial direction. At this time,

wise businessmen are beginning to double-check on credits and collections because certain external forces are at work that indicate that such action is prudent.

The Easy-Money Era

Because money has been plentiful for a number of years, most businessmen have worried little about credits and collections, and in general, bad debt losses have been very low. For this reason, there has been a letdown in this phase of management. Businessmen, even those who were right on the top of credits and collections before the war, have grown lax in this

supervision, have extended credit too freely and failed to follow up delinquents promptly.

Now is the time to back-track to the credit and collection procedure of prewar days and adopt a sterner attitude toward those who buy on credit because the business gauges indicate that consumers aren't so flush with money as they were a year or so ago. Consumer credit is nearing the 15 billion mark and on the uptrend. The high peak of employment may be a mirage to many businessmen, hence, this warning.

Trends

Department stores, because they cater to a wide range of customers, have always been good harbingers of sales and collection trends and they report that the paying habits of customers are slipping, that more accounts are moving into the slow-pay and bad debt category and it is expected that the bad debt ratio will continue to rise. This means that businessmen must place greater emphasis on careful credit granting and effective collection methods.

Despite high employment figures and higher individual earnings, expendable cash seems to be drying up, more people are using credit in some form. The average factory wage last June was \$48.91 but, in that same month, the consumer price index hit a new record high of 157.1 and wholesale prices have moved upward since, so that the average purchaser is being squeezed for ready cash and must put it "on the cuff" with the easy-going creditor "holding the bag."

Other Economic Factors

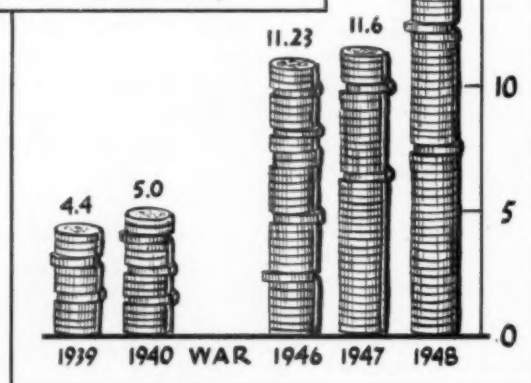
Export volume is another external factor that affects every businessman here. During the postwar period, exports have helped to keep business at high water but exports in June, 1947 suffered a setback of 13 per cent below the figures for the previous month because France and Great Britain are feeling the "dollar squeeze." It is estimated that 50 per cent of American dollars in world markets have been absorbed in trade balances favorable to us but unfavorable to our foreign customers and there seems little chance that this condition will be changed in the near future.

Last November 1, the government ended consumer credit controls and this has had some tendency to increase the use of credit by consumers. Here again, the external factor must be considered. Under Regulation W, the delinquent customer could be told that the government would not permit further purchases until an account had been paid and this acted as a brake on outstandings. With this control discontinued, the trend might be toward the greater use of credit in creating sales volume. Not only are consumers

LOANS OUTSTANDING

AGRICULTURAL
COMMERCIAL
INDUSTRIAL

(Scale in Billions of Dollars)



likely to buy more on credit but some businessmen will want to sell them more on installments or open account and such a development would create a hazard that all wise businessmen will take into consideration.

Tighten Credit Rules

For some time, businessmen have not been getting enough references on new accounts, often granting credit without an investigation of any kind. Now is the time to correct this defect. Every creditor should get satisfactory references before granting credit and query the references, not only as to paying habits but whether the credit-seekers have been increasing their credit purchases of late, indicating a shortage of cash

in line with the general trend. Remember, when money tightens, some credit-seekers have a bad habit of buying the limit from one merchandiser, not paying the bill and opening up an account elsewhere.

Old accounts should be watched too. If payments are delayed, it may be wise in some cases to reduce the credit limit. Before the war, some businessmen reviewed their credit reports on file every few years on the assumption that a debtor's financial standing and paying habits change from time to time. With external factors what they seem to be at this time, it is wise to adopt a policy of this kind now. The 1942 report on a credit-seeker may have changed considerably.

Since 1940, businessmen have not only extended credit with greater abandon but they have permitted customers to buy larger amounts on credit, and so, if the increase in bad debts reported by department stores is indicative of a general trend, businessmen are likely to experience higher bad debt losses in dollars and cents than they did in prewar years for the simple reason that they are carrying more accounts receivable on their books.

Consider Total Credit Load

Too many businessmen review only their own accounts receivable when appraising the safety of credit extension but, here too, they should consider the matter externally. A credit-grantor may put a limit of \$250 on a credit-seeker's purchases but he should always remember that other businessmen give credit too and they may have sold the same customer on open account or time payment, so that, in the aggregate, the customer has obligations running many times those shown on the one set of books, and if the other businessmen have been overly lax with credit during the recent years, the customer is likely to be booked for much more than he can carry safely, should his bankroll be hit by a reversal in our economic situation. This applies to business organizations as well as individuals.

(Please turn to page 176)

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Inventory Simplified

A Perpetual System

David Markstein

New Orleans, La.

In these days of rapid price fluctuation it is more essential than ever to have all information on inventory ready at your finger tips. Here's How!



HOW can you determine which merchandise is wanted by enough customers to make selling it a profitable operation for you? How can you decide on the quantities to carry in stock? How can you be sure when to re-order? Or in what quantities? When prices change, is there any quick way to insure the right mark-up so that all of your stock of the line—old and new—will carry a satisfactory profit?

An efficient system of stock control supplies the answers to these questions. The wise heating and sheet metal contractor does not guess at what his stock may be at any given time; he *knows*. Accurate inventory records are a must to efficient operation of a contracting business. But they need not be the bother, trouble and headache that contractors usually associate with inventory taking.

The old-fashioned method of "taking inventory" at periodic intervals has been replaced today with the perpetual inventory. Instead of calling a halt to all operations every three or six months, and tying up all of the employees on a long-drawn-out and tedious counting job, good business men today keep their inventory records in a card file, taking physical inventory no more than once a year, and then only as a check against the accuracy of the perpetual inventory system.

Ease of Operation

The perpetual inventory offers many advantages in addition to the saving in operational overhead. It is easy to keep. A few quick notations give a complete picture of your reserve stock situation at all times. Moreover, good perpetual inventory records are a first-rate pricing tool.

Often, when prices changed, the chore of fixing a selling price that would allow a fair profit at the new price on both old and new stock plagued contractors. But with a perpetual inventory system, this job is as simple as installing a humidifier. A few quick notations on a card, a minute spent adding figures and then arriving at an average and, presto! The new

selling price is decided upon. What's more, it is a *right* price, both profit-wise and competition-wise.

You are never likely to be caught short of stock if you use a perpetual inventory system. When merchandise is drawn out of reserve stock to be installed on a job, the fact that your inventory is left too low becomes immediately apparent as soon as the withdrawal is noted on the perpetual inventory card. You know when to reorder, and you know the quantity you need to buy.

Requirements for System

Such a system sounds complicated. But in practice, it is not. All you need is a series of file cards. Five-by-eight-inch cards do the job very well. They can be kept in a visible reference file of the Kardex type or, if you have no such file, in an ordinary five-by-eight-inch card cabinet.

Each card has space at the top for the name of the product and a space for indicating the maximum and minimum quantities to carry.

The maximum can be determined by good horse sense. It is the number which you can expect to sell in whatever reasonable turn-over period you wish to use—two months, three months, six months, or a year. The minimum stock quantity should be decided upon as the smallest number which will carry you over, with a top demand from customers, until you can replace the stock in the normal way.

Taking dust filters as an illustration, the number of filters that would constitute a minimum stock can be determined, planning on perhaps a 30 or 60-day supply. Also to be considered is the length of time needed to replenish stocks. When the inventory control card shows that the minimum figure has been reached, then it is time to order new supplies.

One excellent feature of a perpetual inventory system is that it not only tells you what is on hand every day but also informs you when to re-order.

(Please turn to page 178)

NEWS SUMMARY OF THE MONTH

NWAH & ACA Convention

THE 1948 MID-YEAR CONVENTION of the National Warm Air Heating and Air Conditioning Association will be a "One-Two" convention, according to Atlee Wise, President of the Association. This description of the coming semi-annual meeting of Association members was given in the announcement of the convention which is scheduled for June 29 and 30 at the Edgewater Beach Hotel, Chicago.

The "One-Two" features of the two-day convention program promise a fast-moving "on-the-button" series of attractions for convention attendants. The first day of the two-day meet will be devoted to a concentrated program dealing with subjects of pertinent interest to Association members as well as the entire Industry.

The second day of the convention will be devoted exclusively to fun. Members of the Chicago Convention Committee are busily arranging a full day of recreational activities, featuring a golf tourney at an outstanding Chicago golf club. Other activities will include tennis, swimming and dancing at the Hotel, as well as the races at Arlington.

Furnace Shipments—December & 1947 Totals

FIGURES ON FACTORY SHIPMENTS of warm air furnaces for the month of December, 1947 have been issued by the Department of Commerce and it is also possible now to compile totals for the year. A total of 67,642 warm air furnaces were shipped in December and of that total 35 per cent were coal fired, 42 per cent oil fired and 23 per cent, gas fired. This resulted in a percentage of automatic heating units for the month of 65. Type of air circulation was divided 59 per cent for forced warm air and 41 per cent gravity.

Total shipments for the year of 1947 were 844,476 and automatic heating accounted for 58 per cent of this total—coal, 42 per cent, oil, 36 per cent and gas, 22 per cent. Forced warm air furnaces made up 54 per cent of the totals for the year with gravity adding up to 46 per cent. These percentages are unofficial, being based on the unadjusted totals of shipments but should not vary greatly from the official percentages.



Fuel Conservation Survey

THOUSANDS OF GALLONS of scarce and sorely-needed fuel oil can be saved each week in homes, commercial buildings and institutions in northeastern United States by properly adjusting burners in heating systems, according to preliminary results of a continuing survey which were disclosed today by the Socony-Vacuum Oil Company, Inc.

Proper burner adjustments, requiring only about an hour's work by experienced burner-maintenance men, may save fuel oil users as much as 25 per cent in extreme cases on their annual bills, the survey indicates. These savings would more than offset the cost of the adjustments in practically all instances.

Socony-Vacuum officials emphasized that their conclusions were based only on burner adjustments, whereas still greater savings in fuel oil could be obtained in many cases with changes in combustion chambers and burner nozzles and installation of draft regulators and baffles.

The Socony-Vacuum survey, which yielded conclusions on the amounts of probable wastage from improper adjustments, was confined to a type of burner which, officials said, represent about 75 per cent of domestic central heating installations. The latter figure includes about 2,700,000 of the nation's 3,600,000 installations for fuel oil heat.

Data for the Socony-Vacuum survey came from visits by the company's experts to homes and buildings throughout New York and New England and research at the Socony-Vacuum Brooklyn laboratory.

The company concluded from its survey that at least seven percent of consumption of fuel oil in eastern United States can be conserved by minor adjustment of burners alone, while with further modification in the majority of burner installations an overall saving of 10 per cent is possible.

The Socony-Vacuum engineers used a newly-developed "Mobilheat Tester" which, they said, measures stack temperatures, draft, carbon dioxide content of the flue gases, and the amount of smoke produced by

Rescue at Sea!

TOMAS C. MONTANEZ, ship's carpenter of the liner, Santa Clara, (center) thanks Capt. John Fordan, of Wallingford, Conn., (left) and Norbert Berghoff, treasurer of Wayne Home Equipment Company of Fort Wayne, Indiana, after the Santa Clara docked in New York February 24 from Colombia, South America. Montanez was rescued from the Caribbean Sea February 20, after three hours in the water. He was sighted by Berghoff after Capt. Fordan had turned his craft about and searched more than 30 miles. Capt. Fordan said that the chances of locating the man in the sea were no better than 1000 to 1, since darkness was coming on and the swells rising.

Aluminum Shipments

BUREAU OF THE CENSUS Department of Commerce has announced that shipments of aluminum wrought products during January totaled 140 million pounds. These shipments were slightly higher than the 138 million pounds shipped in December, 1947 and only 5 per cent below the postwar peak of 147 million pounds in October of 1947.

January shipments of plate, sheet and strip totaled 109.7 million pounds, a slight drop from the December total of 110.3 million pounds.

Gas Sales

SALES OF NATURAL GAS in the quarter ending December 31, 1947 were 646,400,000 mcf (mcf indicates thousand cubic feet), an increase of 12.9 per cent over sales of 572,400,000 mcf in the comparable quarter of 1946. For the 12 months ended December 31, 1947 total sales of natural gas aggregated 2,506,000,000 mcf, an increase of 14.2 per cent over sales of 2,195,000,000 mcf in 1946.

Sales of manufactured gas in the fourth quarter of 1947 were 108,000,000 mcf, a gain of 1.7 per cent over 107,100,000 sold in the last quarter of 1946. For the twelve months ending December 31, 1947 manufactured gas sales totaled 426,900,000 mcf, a gain of 5.3 per cent over 405,300,000 mcf sold in 1946.

Steel Price Increase Explained

AS A RESULT of the recent unfavorable publicity given the steel industry because of the price rise in semi-finished steel products Edward L. Ryerson, chairman Inland Steel Co., issued the following statement:

"Recent newspaper articles have given the impression that there has been a general advance in steel prices. This is not correct, and as far as Inland Steel Company is concerned, our only advance has been on semi-finished steel products.

"These products are sold by our company to only four customers. In 1947 the tonnage involved represented less than two per cent of our total mill shipments of steel products. During the year this semi-finished steel was either sold at a loss or at a profit per ton far below our general average.

"Because of this unsatisfactory return we had given serious thought to either discontinuing the sale of these products or advancing the prices. We determined to continue production because of the needs of the four customers involved who could not secure the material elsewhere. We hesitated to advance the prices because of our long-established practice of selling our products at prices which are no higher than those of our principal competitors.

"On February 13 one of our customers advised us of the price adjustment on these products made by the United States Steel Corporation. On February 14 this information was published in the daily press and on February 17 we determined to advance our prices.

"Several of our other and more important products should sell at higher prices to assure a satisfactory return. We have made no decision to change these prices at present. However, if the United States is to have a strong and expanding steel industry, the prices charged for steel products must be adequate to provide for growth and to attract investment capital."

N.L.R.B. Orders Election in Struck Plant

THE NATIONAL LABOR RELATIONS BOARD, for the first time under the Labor Management Relations Act, ordered a collective bargaining election to be held at a plant where a strike is in progress.

The employees will vote, within 30 days, on whether they wish to be represented in bargaining with the company by District 54 of the International Association of Machinists or the P.M. Co. Independent Union, or by no union. Both unions are unaffiliated.

The election will be held at the Pipe Machinery Company of Cleveland, Ohio. The firm manufactures gauges, pipe-threading machinery and small tools.

The Board described the walkout, which began Feb. 17, 1947, as "an economic strike." The Machinists union, which had a contract with the company, asked a general wage increase of 25 cents an hour at the time of the strike.

Inasmuch as the plant has been reopened, the Board ordered that all strikers and all persons hired since the strike began should be permitted to vote. Both groups will be presumed eligible to vote, but their ballots will be subject to challenge, the Board declared.

The new labor relations law provides that "employees on strike who are not entitled to reinstatement shall not be eligible to vote" in N.L.R.B. elections. The Board pointed out, however, that it would be impossible to determine at present which strikers are entitled to be reinstated.

Building Contract Increases

CONTRACTS AWARDED FOR CONSTRUCTION in the thirty-seven states east of the Rocky Mountains during the first two months of this year topped the dollar total of awards for the corresponding months of last year by 28 per cent, according to F. W. Dodge Corporation, a fact-finding organization for the building industry.

February's awards by dollar volume were 11 per cent greater than January's and 54 per cent greater than those of February of last year.

The dollar valuation of contracts awarded in the first two months of this year east of the Rockies was \$1,297,173,000 distributed by the following classifications: nonresidential building \$512,939,000; residential \$470,348,000 and heavy engineering works \$313,886,000.

Percentagewise, the gains during the first two months of this year compared with last were greatest in heavy engineering awards, which were up 54 per cent. Nonresidential awards showed a 49 per cent gain and residential awards were up 1 per cent.

More than a third of all contracts awarded during the first two months were for projects classified as publicly owned.

Stainless Steel Process Film

USE OF OXYGEN and other modern techniques of electric furnace production of stainless steel is brought to the screen in full color in the latest motion picture to be released by Allegheny Ludlum Steel Corporation.

Titled "Melting and Refining of Modern Steels," the 16 m.m. movie was shot at the company's Brackenridge, Pa., plant and is a start-to-finish story of stainless steel as it is melted in an ultra-modern 50-ton

electric furnace. During 20 minutes of color and action, every high point in the melting process is covered.

Telephoto lenses are used for interior shots which make it appear that the camera is actually inside the furnace with molten metal boiling at temperatures hotter than an active volcano.

For what is believed to be the first time, the process of injecting oxygen directly into the molten metal for carbon reduction is portrayed. The onlooker has a chance to study the angry bath as the oxygen is injected. He also watches from above as the huge furnace top is lifted, exposing the interior.

Designed for technical groups, this instructive and entertaining film may be obtained for free showings on request to the company's headquarters in Pittsburgh, Pa.

California Home Show

CONCENTRATING MORE THAN EVER before on actual construction processes, materials, appliances, and projects, the Construction Industries Home and Building Exposition of Southern California, June 10 to 20 at the Pan-Pacific Auditorium in Los Angeles, is being tailored to fulfill the expressed desires of the 120,000 people who attended last year's show.

President Milton J. Brock of the exposition said that gratifying public demand, the 1948 show will feature such popular exhibits as homes, home materials, housing tracts, model houses and maps, suggestions, and ideas for home building and renovation. There will be an unprecedented variety of displays showing every building material in its actual uses, applications, shapes, forms, colors, advantages, and installation processes.

Last year's show broke all records for attendance and exhibit space sold but the 1948 show is expected to top those records and in addition set new records for volume, variety and interest of exhibits.

Emphasizing the kind of exhibits which will be of maximum value to the construction trade itself while being educational and informative to the general public and particularly the home-building public, are such exhibits as that of the Building Contractors' Association, designed to inform the public about the activities and public contributions of the building contractor.

Setups and installations of air-conditioning, and its winter ally, heating, with the most modern applications of comfort in the home or office, will be presented in the Heating, Piping and Air Conditioning Association exhibit.

Inventory Exchange

THE NATIONAL HEATING WHOLESALERS' ASSOCIATION has announced that "Inventory Interchange," a system whereby member Heating wholesalers can fill their inventory shortages with overages held by another member and can in turn dispose of their inventory overages to other members short in those items, has now been put into operation by the Association.

In making the announcement, Mr. Richard M. Colegrove, executive secretary of the Association said, "We have started 'Inventory Interchange' into operation this month because we feel that the time is ideal for this project. Most of us have just finished taking inventory, and each knows what items he holds in

excess and on what items he is short. Then, too, we are, to a considerable extent, still in a shortage era, and the securing of inventory items is of primary importance in completely servicing our market. Added to this is the recent imposition of local rules and regulations by municipalities and fuel supplying agencies which have caused violent changes in demand for certain types of equipment in various sections of the country. All this adds up to make the maintenance of proper inventory quite a task for the Heating Wholesaler and the time opportune to utilize 'Inventory Interchange' to help solve the problem."

Long Range Housing Policies

EMERGENCY HOUSING MEASURES, designed merely to patch up the past, must give way to policies that are geared to a long-range future, Administrator Raymond M. Foley of the Housing and Home Finance Agency declared today.

The point has been reached, he explained, where housing programs must be evolved that are directed toward the establishment of a continuing high level of homebuilding sustained by an expanding volume of low-cost units. New housing construction is so vital to the social and economic welfare, he added, that make-shift measures alone will not suffice.

"This transition to a sound, continuing homebuilding economy," Mr. Foley said, "is one of the most significant points of the housing message that President Truman recently sent to the Congress. The President presented a series of important concrete proposals for such a program which this Agency believes are both practical and needed at this time."

Transition to a stable housing economy, Mr. Foley said, depends on three things: (1) Sustaining a high volume of home production; (2) producing an increasing volume of housing at lower cost; (3) providing a larger volume of rental housing.

"There is no one single answer to achieving these results," he said. "They must be met by various aids and methods. Even more, they cannot be accomplished simply by Government or legislation. They must be done primarily by private industry, with Government measures supporting and assisting it wherever proper."

No Increase

VETERANS TAKING APPRENTICESHIP or other on-the-job training courses under the Servicemen's Readjustment Act (G.I. Bill) and the Vocational Rehabilitation Act (Public Law 16) are not entitled to increased subsistence allowances authorized under a recently enacted law, Veterans Administration said.

The higher rates are available only to veterans in schools, colleges and universities pursuing full-time courses of education.

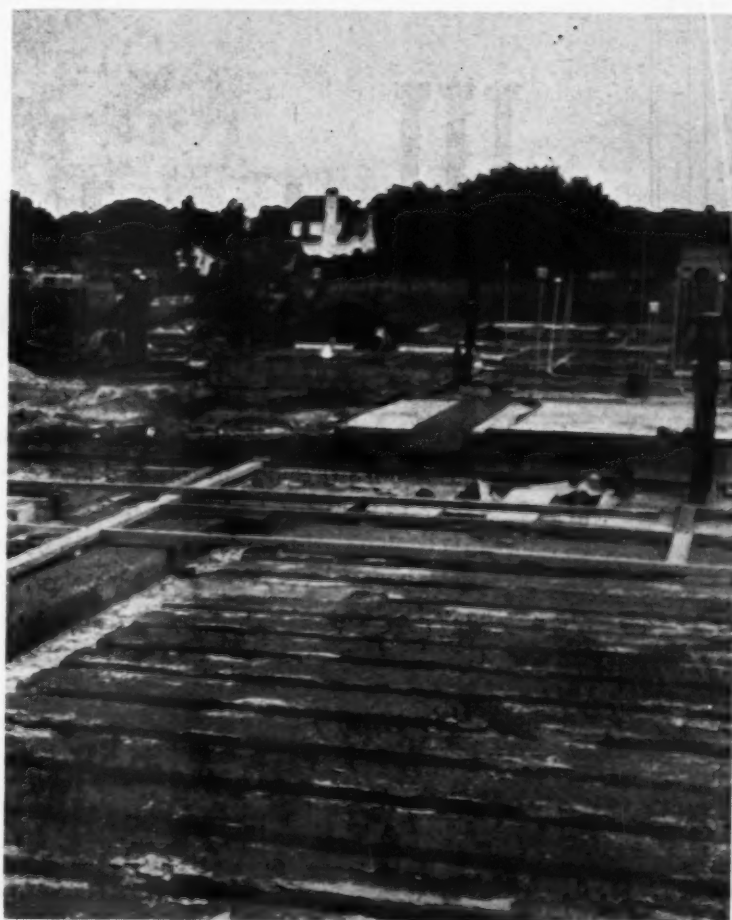
Apprentices and job trainees (receiving compensation for productive labor) will continue to receive subsistence payments at the old rates of \$65 a month for those without dependents and \$90 for those with dependents.

The new rates for full-time veteran-students are \$75 a month for a veteran without dependents, \$105 for a veteran with one dependent, and \$120 for a veteran with more than one dependent.



RESIDENTIAL AIR CONDITIONING *Section*

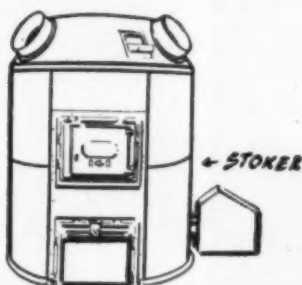
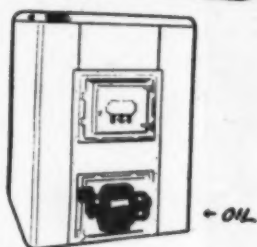
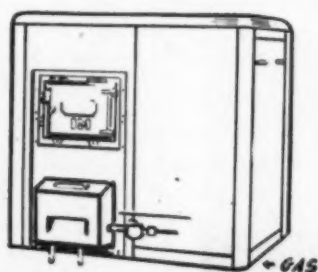
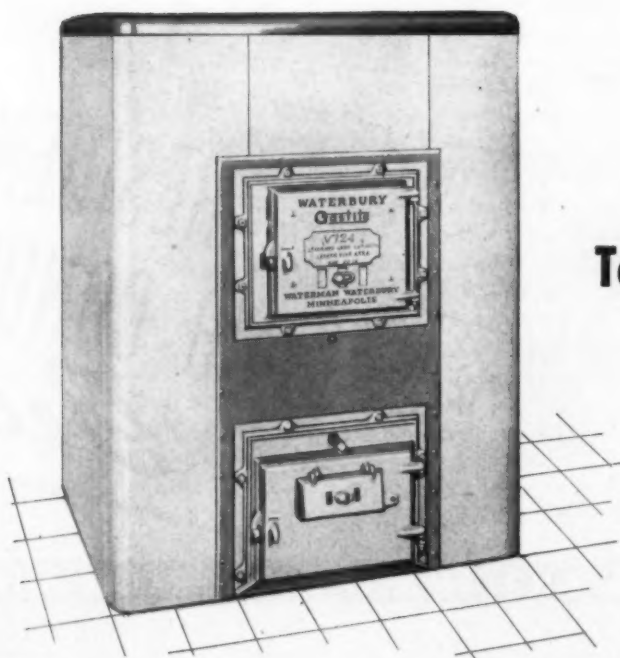
DEVOTED TO HOME AND SMALL COMMERCIAL AIR CONDITIONING



Adaptable to ANY Fuel

The
700 Series

To Meet
Today's Problem



Waterbury

700 Series Coal-Fired Units are made in both round and square gravity models and in a complete winter air-conditioner. All of these units are equipped with the famous Waterbury Gas Tight body—and they convert easily to oil, gas or stoker. As coal-fired units, or converted, they live up to Waterbury's standards of efficiency.

It's What's Under the Casing that Counts!

THE WATERMAN - WATERBURY COMPANY
1122 JACKSON ST. N. E. MINNEAPOLIS 13, MINN.



THE "housing shortage" is too old and oft-told a tale to engender much excitement at this time but there is still interest in the way that individual communities and contractors have met the challenge that has been posed by the conditions existing since the end of the war. Considerable opinion has been voiced that one logical approach to the problem of reducing the backlog of needed dwellings is by means of the "factory-made" house. After all, in meeting a crisis such as the one this country faced after the war, speed of construction was a vital factor.

Project in Peoria

However, a frequent fault with the pre-fabricated house has been the fact that it is usually small, often basementless, and generally hard to heat. There is a housing project in Peoria, Illinois that appears to have met this difficulty in a rather satisfactory manner.

W. G. Best, Inc., manufacturers of "Factory Built Homes," have been erecting their homes in Peoria for a number of months past. Over six hundred have been completed and the heating systems have been installed by the Lee Wagener Co., furnace and sheet metal contractors of that town.

Some of the physical characteristics of the homes offer background for a discussion of the heating installations that have made the homes comfortable, no matter what the weather.

House Specifications

The houses have a base dimension of 26 by 26 feet but there are five different elevations to provide variety in roof pattern for the blocks that are built. They consist of living room, dinette, kitchen, two bedrooms, bath and utility room; are of basementless construction and are built on a four-inch concrete slab with thirty-two inch footings and clay and gravel fill. The homes are all being heated by warm air and the Wagener firm has used gas and oil fired equipment manufactured by Morrison Steel Products Co., of

HEATING The Small Home

A story of the way one contractor in an Illinois town is erecting and heating the small "GI" house.



An aerial view of one of the projects in Peoria.



Winter air conditioning unit being delivered to the job for installation.

Buffalo, N. Y., and controls are by White-Rodgers. The furnace is located in the utility room along with a hot water heater and an automatic washing machine.

Heating Plant

The heating system, as installed, calls for a square plenum on top of the furnace with individual round pipes (top take-off) leading to a high side wall register in each room. Cold air is returned to the heating plant by means of a large cold air return at floor level in the living room which makes the return more or less centrally located. One characteristic of the systems has been their adjustment for continuous air circulation from the beginning.

"CAC"

By adjusting the heating plant in accord with the "Continuous Air Circulation" program of the National Warm Air Heating & Air Conditioning Association the Wagener company has secured efficient heating results and put the warm air systems into operation under the best possible conditions for customer satisfaction. The heat loss of the house described is 45,000 btu per hour and the furnace installed has a capacity at the bonnet of 67,000 btu. In the homes heated with gas, the average bill for last year's heating season was about \$61.50.

Furnace pipe and fittings used in the jobs are made in the Wagener shop to exact sizes and lengths so that there is no need for cutting or fitting when erecting. The contractor has figured that the average time for installation is two hours, for one man. The pre-fitting makes it possible for the ductwork to be installed with a screw driver and electric drill as the only tools.



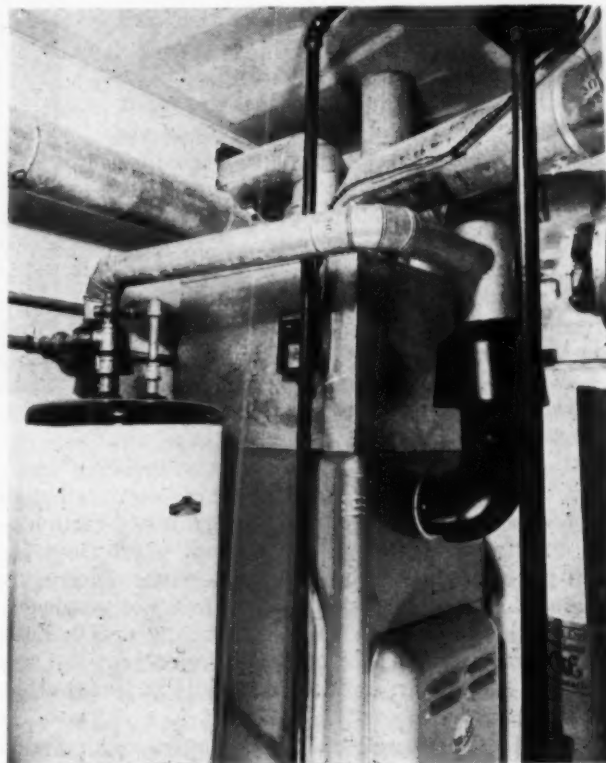
The Central cold air return described in the text is shown here.

The Best Company has managed to reduce the manufacture and erection of the houses to their simplest terms. All union labor is used in the fabrication of the houses and the sides are built in jigs which provide for placement of the door frames and windows complete with hardware. The roof is built in a jig of truss design and the entire assembly is then hauled to the site for erection. Erection of the walls and roof is figured at eight hours for five carpenters and the interior partitions are installed with either plaster or dry wall construction after the house is up. In good weather and under normal working conditions one house is completed each working day.

The rapidity with which a house can be manufactured and erected is at least partially due to the fact that during the entire process all man-hours are expended in the most efficient fashion. In producing the elements of the house in the factory the work is held in jigs at waist height, eliminating bending or holding material in place. Sheeting and two by fours are cut to exact length for assembly in the units and every available type of power driven machinery is used; electric saws, nail drivers, screw drivers, planers and joiners. Power conveying equipment facilitates the progress of the housing units along the assembly line. Sheeting used for the walls and roofs of the houses is standard $\frac{1}{2}$ inch plywood.

Metal Stack Used

The houses are erected with standard metal gutters and the contractor has been able to use a metal double



The exact method of heat distribution can be observed in this view of the heating plant.

vent stack with a top hood to eliminate down draft. At the point where the stack enters the roof a leak-proof roof jack is used so that no roof flashing is required.

It has not been an easy matter to secure the approval of the various building departments for this type of stack. The Peoria building department, however, has approved its use in basementless houses where gas or oil is the fuel. Putting a brick chimney in a basementless house is rather an inefficient thing to do and where it is possible to use the metal stack it is practical since such a stack is low in cost, durable and can be made by any sheet metal shop.

While considerable progress has been made in the problem of heating the basementless house by such firms as Wagener, a solution that is completely effective has not yet been accepted by the majority of contractors. At one *Indoor Comfort Conference* a contractor said in a discussion, "The question is not—'How do you heat the basementless house'—but rather—'Can you heat the damned things?'" As *AMERICAN ARTISAN* comes across different techniques for solving the problem they will be presented to our readers in order to give the benefit of other experiences and the reader will be able to decide for himself the best way to handle the jobs he is putting in.



HEATING A HANGAR WITH WARM AIR

By "putting heat on the spot" Johnston Aircraft Corporation solved the problem of how to keep part of its new hangar at Municipal Airport in Atlanta, Georgia, warm enough for mechanics this winter.

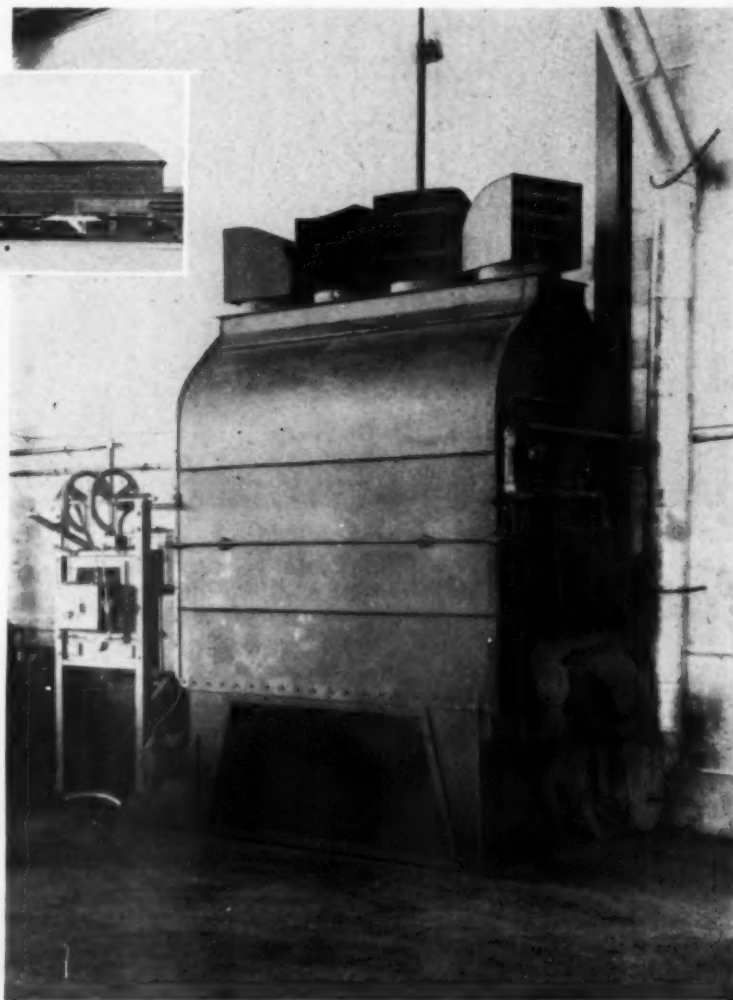
F. A. Buchanen, who manages the sales and charter service and is Atlanta distributor for Cessna aircraft, explained that he found himself "on the spot" after the 160-ft by 120-ft hangar had been built. It had not been possible, due to shortages, to make arrangements for enough fuel to supply two gas-fired Dravo Counterflo heaters intended for the building.

A conference with Mauldin & Bailey Company, heating contractors, and O'Shea Engineering Company, both of Atlanta, resulted in the solution to their problem.

"Why not," he was asked, "use just one heater to warm the part of the hangar that needs it most?"

Heating just one section of the large building, which has a high roof and 19,200 sq ft of undivided floor space, is accomplished by "working level" recirculation of warm air. A volume of about 18,000 cu ft per minute of air heated to 80 F above room temperature is discharged from the heater's four outlet nozzles 11 ft. above the floor. When return air is drawn from all directions at floor level into louvered grilles at the base of the heater, the rate of flow is so low that no drafts result.

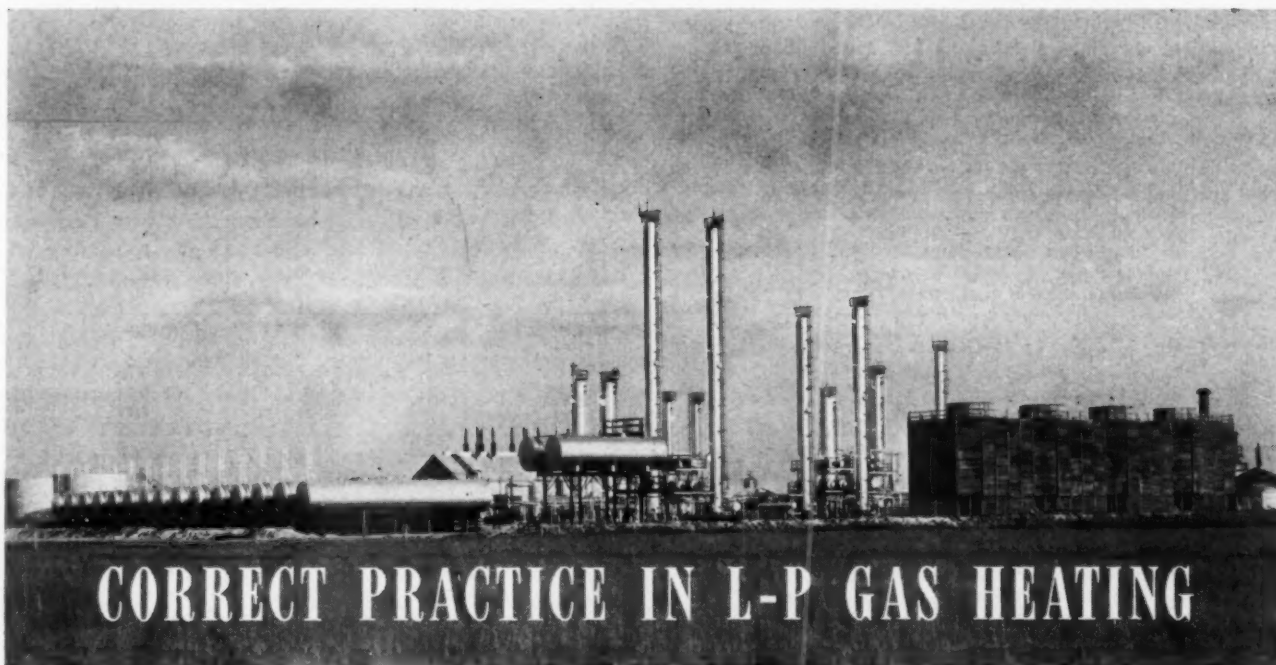
This balanced recirculation establishes and maintains what might be termed a "comfort zone" in the area where heat is required, without loss of excessive



heat to the roof or to other parts of the hangar which are used for storage. This method of warm air recirculation—confining the heat just to the working area and not attempting to do more than absolutely necessary—stretches the small gas supply to the maximum in heating ability.

Since the heater has an output of 1,650,000 Btu, the so-called "comfort zone" is fairly large—sufficient to permit work simultaneously on several aircraft.

Another feature of this system that has pleased the airport operators is the speed with which the heater operates. It can be turned off at night to save fuel and started again in the morning to establish desired temperatures almost instantly.



Photo—Oil and Gas Journal

Kenneth D. Wolfe
Fisher Governor Co.
Marshalltown, Ia

Part II — The source and general properties of LP gas were discussed in the previous article of this series. This article will be devoted to the detailed physical, chemical, and combustion properties of LP gases.

IT WAS noted before, that we are referring to Butane and Propane or mixtures of these gases, when the term LP gas, is used, and that these gases are liquefied when compressed under moderate pressures at standard temperatures. Now let us examine the details of the other physical properties of LP gas.

All hydrocarbons, the chemical family to which Butane and Propane belong, with the exception of Methane, are heavier than air. This is probably the most important single physical property of these gases to remember. When we speak of a gas being heavier than air, we are referring to the weight or the specific gravity of the vapor or the gas. The specific gravity indicates the relative weight of the gas when compared with air. Air having a specific gravity of 1, Propane has a specific gravity of 1.5, and Butane 2.0. Therefore, it will be readily seen Propane is $1\frac{1}{2}$ times heavier than air, and Butane is twice as heavy as air.

The fact that Butane and Propane are heavier than air is one of the major differences between LP gases and the other fuel gases in common use. Other gases such as natural or manufactured gas, being lighter than air, will rise if they escape from confinement, and will therefore tend to dissipate by mixing with the surrounding air. In the open they will blow away or in a gas furnace the unburned gas will pass up the chimney and be harmlessly vented. When LP gases escape, being heavier than air, they tend to settle in

low places such as cellars, pits or other openings below the ground level. This means that if you have an LP gas leak in a basement the gas will collect on the floor and even run down the drain if the trap happens to be empty. In such a situation, it will require a great deal more than normal ventilation to dissipate the escaped gas since the gas is heavier than air. No matter how much you dilute the gas with air, you can never lower the specific gravity of the mixture below 1, consequently, you can never get the mixture lighter than air.

A good example to remember when considering this peculiar property of LP gas can be found in a glass of water. LP gas acts very much like water when in the gaseous state. If you upset a glass of water on a table, the water will spread over the table top until it comes to the edge and will then run down onto the floor—LP gas will do exactly the same thing. If you set an open container full of LP gas on a table it will vaporize and the vapor or gas will run down the side of the container onto the table top and thence spill over on the floor and if the air in the room is still, the gas will lay in a partially diluted form as a strata of air-gas mixture on the floor. If this gas were to be ignited, it would probably burn rapidly rather than explode as the chances are it would not have mixed sufficiently with air to produce an explosive mixture. Do not interpret this to mean LP gas will not explode under some conditions. It will explode with a violence equal to

Physical Properties of Commercial Propane and Butane

	Commercial Propane	Commercial Butane
Formula.....	C_3H_8	C_4H_{10}
Normal State, 60°F. 30" Mercury.....	Gas	Gas
Freezing Point (or Melting), °F.....	-310	-210
Boiling Point, °F. at 30" Mercury.....	-44	32
Specific Gravity of Gas (Air = 1) at 60°F., 30" Hg.....	1.52	2.00
Specific Gravity of Liquid (Water = 1) 60°/60°F.....	0.51	0.58
Weight Per Gallon of Liquid at 60°F., lbs.....	4.24	4.85
Gallons Per Pound of Liquid at 60°F.....	0.236	0.206
BTU Per Gallon (Vaporized).....	91,500	102,600
BTU Per Pound (Vaporized).....	21,560	21,180
BTU Per Cubic Foot (Vaporized).....	2,520	3,260
Latent Heat of Vaporization at Boiling Point, BTU/lb.....	185	166
Latent Heat of Vaporization at Boiling Point, BTU/Gal.....	785	807
Specific Heat of Gas, BTU/Lb./°F. at 60°F.....	0.405	0.385
Specific Heat of Liquid, BTU/Lb./°F. at 60°F.....	0.590	0.550
Density of Gas, Pounds per cubic foot.....	0.116	0.153
Density of Liquid, Pounds per cubic foot.....	31.7	36.0
Cu. Ft. of Gas/Gal. Liquid at 60° F., 30" Hg.....	36.5	31.0
Cu. Ft. of Gas/Lb. Liquid at 60°F., 30" Hg.....	8.55	6.51
Vapor Pressure Lbs./sq. in. Gauge		
Temperature —10°F.....	20
0°F.....	28
10°F.....	45
32°F.....	60
60°F.....	100	12
80°F.....	130	22.5
100°F.....	190	37
120°F.....	240	55
Combustion Data:		
Cu. Ft. Air Required to Burn 1 cu. ft. Gas.....	23.5	30.0
Cu. Ft. Oxygen Required to Burn 1 cu. ft. Gas.....	5	6.25
Cu. Ft. Air Required to Burn 1 lb. of Gas.....	200	195
Ignition Temperature.....	920-1020	900-1000
Maximum Flame Temperature.....	3600	3625
Per cent Gas in Air for Max. Flame Temp.....	4.4	3.5
Max. Rate of Flame Propagation in 1" Tube, inches/sec.....	32	33
Limits of Inflammability, Percentage of Gas in Air Mixture...		
Per cent at Lower Limit.....	2.4	1.9
Per cent at Maximum Rate of Flame Propagation.....	4.8	3.8
Per cent at Upper Limit.....	9.5	8.5
Octane Number (Iso-Octane 100).....	125	91
Products of Complete Combustion:		
Cu. Ft. CO ₂ per Cu. Ft. Gas.....	3.0	3.9
Cu. Ft. Water Vapor per Cu. Ft. Gas.....	4.0	5.0
Cu. Ft. N ₂ per Cu. Ft. Gas.....	18.5	23.6
Lbs. CO ₂ per Lbs. Gas.....	3.0	3.1
Lbs. H ₂ O per Lbs. Gas.....	1.6	1.5
Lbs. N ₂ per Lbs. Gas.....	12.0	11.8
Ultimate CO ₂ , Per cent by Volume.....	13.9	14.1

Fig. 1

most common gases but it requires a more exact mixture to form an explosive mixture than do the other gases. This is one of the good points in its favor.

We speak of explosive limits as the per cent of gas in the air. For Propane the lower limit is 2% gas in air and the upper limit is 9.5% in air; if there is a greater concentration of gas in the air than this upper limit, it will simply burn, or if there is too little air present, there may not be sufficient oxygen present to support flame, and it will not burn. Butane has a lower limit of 1.5% up to 8.5% for the upper limit.

These are comparatively narrow limits when consid-

ered with other gases such as natural which has an explosive limit range of 4.8% to 13.5%, and manufactured gas with an explosive range of 6.4% to 37.7%. This of course means that the explosive range of LP gas is more critical and therefore less likely to occur by accident. But don't forget it can and will explode with extreme violence under normal conditions found in the usual house, particularly in the basement or furnace room if gas is allowed to escape and then happens to be ignited.

Should you ever encounter a basement full of LP gas it is wise to open all windows and doors for several

hours and try to dissipate the gas to the outside. Be sure to keep all fires away and do not use an electric fan to draw out the gas, since the motor would probably arc and an explosion would result.

LP Gas Is Odorized

LP gas in the pure state is odorless but regulations require that strong smelling odorants be added so that even small gas leaks can be located. Therefore all LP gas which might be used in the home or commercially is odorized to give it what is commonly recognized as a "gas odor." Should a gas leak be detected the safe procedure is to shut off the valves at the tank or tanks supplying the gas and request an experienced gas service man to check the job.

If an emergency makes it necessary to look for a gas leak, do not use a lighted match or open flame hoping to find it. Many people have lost their lives looking for gas leaks with an open flame.

In the actual practice of combustion of LP gas, it is necessary to use a certain amount of excess air compared with the theoretical requirements. How much excess air is to be used depends of course upon the burner design. Table No. 2 shows the ultimate percentage of carbon dioxide to be approached in the combustion of these fuels but this is seldom ever attained in practice. Therefore this table should be merely used as a guide.

Combustion Characteristics of LP Gas

From Table No. 2 it will be noted that it requires approximately 24 cu ft of air for complete combustion of one cu ft of Propane, and 30 cu ft of air for one cu ft of Butane. This is a result of the higher Btu content of LP gases. Natural gas, which averages about 1000 Btu per cu ft, requires only 10.5 cu ft of air for one cu ft of gas, and manufactured carburetted water gas of 520 Btu requires only 4.5 cu ft of air per cu ft of gas for complete combustion.

TABLE NO. 2. COMBUSTION DATA FOR BUTANE AND PROPANE

	Cu Ft Air Required per Cu Ft of Gas or Vapor for Combustion	Products of Combustion in Cu Ft Produced by Burning One Cu Ft			Air Lbs. Required for Combustion of 1 Lb. Gas	Products of Combustion in Pounds Produced by Burning 1 Lb. Gas			Ultimate CO ₂ in Flue Prod. Per Cent
		CO ₂	Water Vapor	N		CO ₂	Water	N	
Propane	23.5	3.0	4.0	18.85	15.70	2.98	1.65	12.00	13.6
Butane	30.0	4.0	5.0	24.50	15.50	3.00	1.56	11.90	14.01

The proper procedure for locating a gas leak is to prepare a cup of soapsuds and with a small brush apply the suds to all joints or points of suspected leakage until the leak is found.

LP Gas Non-Toxic

LP gas is not toxic to humans. The breathing of small concentrations for limited periods will cause no noticeable effect. Exposure to high concentrations for short periods, while undesirable, is not dangerous to life. The U. S. Bureau of Mines reports that a concentration of 1% of Propane or Butane in air produced no symptoms during a 10 minute exposure, but that a 2 minute exposure in 10% concentration caused dizziness.

Butane and Propane are commonly distributed in liquid form under pressure. The liquid of both gases is clear or water white and is lighter than water. The specific gravity of a liquid is the relative weight of that liquid compared with water at 60 F. The specific gravity of water being 1, Propane has a specific gravity of .5 and Butane a specific gravity of .58, or stating it another way, water weighs 8.3 lbs. per gallon, Propane weighs 4.23 lbs. per gallon, and Butane weighs 4.86 lbs. per gallon.

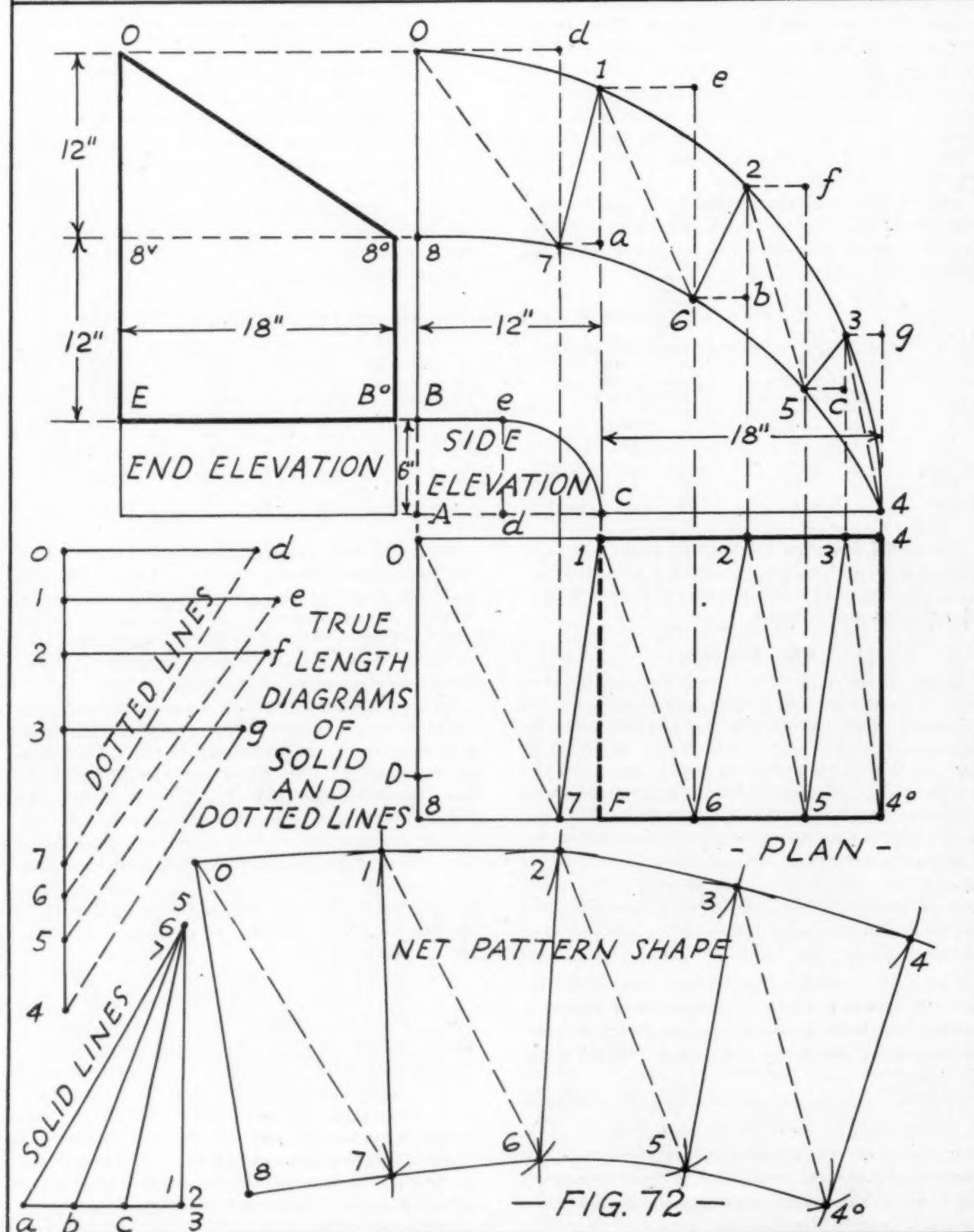
Table No. 1 shows the complete physical properties of the common LP gases, Butane and Propane. This table has been compiled to include all commonly used technical information pertaining to these two gases, and it will be found to be an extremely valuable table for use in handling these fuels.

On a Btu basis, however, most gases require nearly the same amount of air, varying only from 8.5 to 9.5 cu ft per thousand Btu. The theoretical air requirement for various gases is important for burner design, but it is always necessary in actual practice to use air in excess of the theoretical figure in order to obtain satisfactory appliance performance.

Gas burning appliances as a whole meet a very high efficiency standard due principally to the high standards set by the entire gas industry through the medium of the American Gas Association specifications. All gas appliances must pass actual tests in the AGA laboratories before obtaining AGA approval. For instance, forced warm air heating furnaces must deliver 80% efficiency, whereas warm air furnaces of the gravity type must deliver 75% efficiency to gain AGA approval. This means that 80% and 75% respectively of the Btu input must be delivered to the plenum chamber for useful heating.

The pressure of the gas as delivered to the gas burner is important for good combustion. Normally the higher Btu gases require higher pressures and also smaller orifices on a given burner. As a comparison it is quite customary to deliver manufactured gas to a burning appliance at from 3½ to 5 inches water column. Natural gas is usually delivered at from 6 to 8 inches water column and LP gas at 11 inches w.c. These higher pressures are required to create a greater jet velocity effect at the burner orifice to inspirate or entrain the greater required amount of primary air for good burner performance.

- PATTERN FOR TWISTED HEEL ON -
 - CURVED TRANSITIONAL ELBOW WITH -
 - SQUARE BASE AND IRREGULAR TOP -



- FIG. 72 -

Pattern Development for Air Conditioning Fittings*

WILLIAM NEUBECKER

Transitional Curved Elbow

A READER has submitted a transitional curved elbow problem and requests information for developing the pattern for the twisted heel. He states that the profile of the vertical opening at the top has an irregular shape, the dimensions and angles being given. The profile for the horizontal opening at the bottom, is to be square, and its area must be equal to the area of the top opening or profile.

The pattern for the twisted heel requires triangulation for its solution. Fig. 72 in the accompanying pattern page, shows the plan, side and end elevations, with the profiles of the top and bottom openings in their proper relative positions.

Computing the Areas

$O-E-B^{\circ}-8^{\circ}-O$ in the end elevation shows the given dimensions of the profile of the upper opening. By drawing a line from 8° parallel to $B^{\circ}-E$ a rectangle is formed whose dimensions are 12 by 18 inches or 216 square inches in area.

$8^{\circ}-8^{\circ}-O$ has similar dimensions in a right angled triangle. $12 \times 18 = 108$ square inches. $216 \div 108 = 324$.

Now extract the square root of 324; $\sqrt{324} = 18$ the size of the square profile at the bottom of the elbow, shown in plan 1-4-4'-7-1.

Drafting the Side Elevation

First draw the right angle $O-A-4$. Using A as a center with the desired heel radius (in this case 30 in.) draw the quadrant $O-4$. Set off the width of the square duct from 4 to C , also the radius of the throat $C-d$ (in this case 6 in.) and using d as a center draw the quadrant $C-e$ to intersect the vertical line erected from d , at e . From e draw the horizontal line to intersect the line $A-O$ at B . Locate point 8 in the side elevation, in line with $8^{\circ}-8^{\circ}$ in the end elevation. Now with a radius equal to $8-4$ in side elevation, and using 8 as a center, intersect the vertical line $O-B$ extended, at D .

Locating the Patterns for Face and Back of Elbow

Using D as a center with $8-4$ as radius draw the arc from 8 to 4 . Then $4-8-B-C-4$ will represent the pattern for the face of the elbow and $O-4-C-B-O$ the pattern for the back.

Pattern for Throat

The throat pattern will have a rectangular outline whose width will be equal to the girth of the throat

from B to C in the side elevation and whose length is equal to $E-B^{\circ}$ in the end elevation. In the side elevation, $8-O-4$ represents the twisted heel for which patterns are desired which will be solved by the triangulation method. Below the side elevation a plan view is shown looking down on the heel as indicated by $O-4-4^{\circ}-8$.

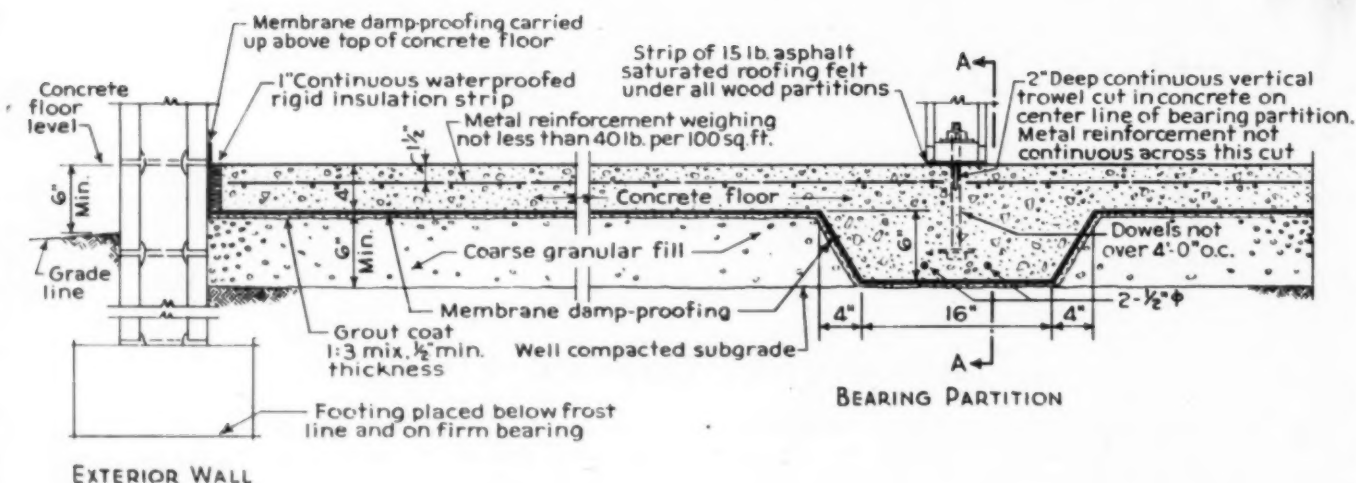
True Lengths for Triangulation

Space the upper curve $O-4$ in the side elevation in any desired number of divisions as 1-2-3 etc; also space similar number of divisions along the center curve $8-4$ as shown by 5-6-7 etc. From the divisions on the upper curve $O-4$ draw perpendicular lines to intersect the back of the elbow in plan as shown by similar numbers. In a similar manner from the divisions on the center curve $8-4$ draw perpendicular lines to intersect the face of the elbow in plan as shown by similar numbers. Connect these intersections by solid and dotted lines in side elevation, also connect similar numbered intersections in plan to correspond to those in side elevation.

Then these solid and dotted lines in plan will represent the bases of triangle to be constructed whose altitudes will be equal to the vertical heights between similar numbers in side elevation. For example: to find the true length of the solid line 1-7 in plan set off this distance on the vertical line in the diagram of solid true lengths at the lower left as shown from 1 to 7, at right angles to which from point 1 draw the line 1-a equal to the vertical distance between points 1 and 7 in the side elevation as indicated by 1-a. Draw a line from a to 7 in the true lengths which will be the true length of the line 1-7 in plan. As the lines 2-6 and 3-5 in plan are similar in length to 1-7, then the line 1-7 in the true lengths will also represent the lines 2-6 and 3-5. As the vertical heights between points 2 and 6 also between 3 and 5 in side elevation are indicated from 2 to b and 3 to c , then these vertical heights must be set off in the true lengths on the line 3-a, from 2 to b and 3 to c and from these points b and c lines are drawn to 6 and 5 respectively and will be the true lengths of similar numbered lines 2-6 and 3-5 in plan. In similar manner find the true lengths of the dotted lines in plan. For example, take the length of the dotted line $O-7$ in plan. Set off this length on the vertical line in the diagram of dotted true lengths as shown from O to 7.

(Please turn to page 180)

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Concrete Floors on Ground

FOR residences without basements or for unexcavated portions under houses, concrete floors on ground provide an excellent type of construction. Recent studies have shown that when properly designed and constructed, concrete floor slabs on ground give better results than other types of floors for basementless construction.

Basementless houses, regardless of the type of floor construction, should not be erected in low-lying areas that are damp or in danger of flooding from surface water. Surrounding ground level should slope away from the house with good drainage and should be at least 6 in. below the finished floor level.

Subgrade

It is important that the subgrade be well and uniformly compacted to prevent any unequal settlement of the floor slab.

All organic matter such as sod, roots, etc., should first be removed and the ground leveled off. Any holes

and irregularities in the subgrade and any trenches for utilities should be filled in layers not exceeding 6 in. deep and thoroughly tamped. Material for fill should be of uniform character and should not contain large lumps, stones, frozen chunks or material which will rot.

The entire subgrade should be rough-graded to an elevation slightly above the finished grade and then thoroughly compacted by tamping or rolling. The finished subgrade should be carefully checked for elevation and profile.

For the best compaction results there is an optimum moisture content for each type of soil. A rough idea of the proper moisture content of ordinary soils, except very sandy ones, may be obtained by squeezing some in the hand. With proper moisture content the soil will cling together but will not be plastic or muddy. If the soil is too dry, it should be sprinkled with water and mixed to the desired condition before compacting. If the soil is too wet, it must be allowed to dry before compaction. If there is any question as to the moisture

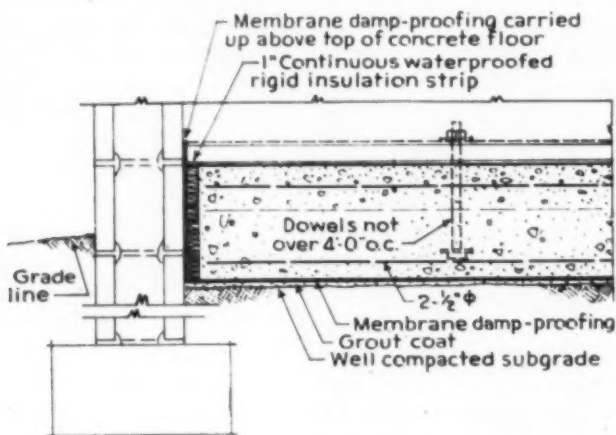


Fig. 1. This is a section taken at A-A of the drawing at the top of the page.

One of the difficulties with panel installations in the past has been the frequently-excessive edge loss to the ground from the panel. Because many panels are installed in concrete slab floors the Portland Cement Association has been experimenting with panel floors to eliminate this objectionable loss of heat to the ground. This article is a summary of some of the results they have obtained. The drawings shown are rather general and should not be taken as a hard and fast rule to follow.

content of sandy soil, more water should be added since an excess of water will not be harmful with this type of material.

Granular Fill

Over the finished subgrade should be placed a granular fill which will have a minimum depth of 6 in. after being well compacted. This granular fill should be made of either coarse cinders, slag, gravel or crushed stone, preferably ranging from $\frac{1}{2}$ in. to 1 in. in size. This fill is intended to serve both as an insulating material and as a protection against moisture from the ground. The fill material should be of uniform-size particles, without fines, so as to insure a maximum volume of air space in the fill. If necessary, the material should be screened to remove the fines. The large volume of air space will add to the insulating qualities and reduce the capillary attraction for any subsoil moisture. If there is any danger of water accumulating in this fill, drain tiles should be installed below the fill and connected to proper drains to insure a dry subgrade.

Provisions for Mechanical Trades

Where required, provisions can be made for embedding ducts for heating systems and supply and waste plumbing lines under the granular fill. Water service supply lines, if placed under the floor slab, should be installed in trenches of the same depth as those outside the building to prevent any possible damage from freezing in case the building is closed during cold weather. Connections to these utilities can be brought to a point above the finished concrete floor level prior to concreting. The electric supply line and all distributing lines for electricity and plumbing are carried in the walls or partitions.

Damp-proofing

After the granular fill has been compacted and brought to grade a stiff grout coat consisting of 1 part portland cement and 3 parts sand should be placed over it to provide a smooth surface for installing the membrane damp-proofing. The grout coat should be at least $\frac{1}{2}$ in. thick and should be broomed or floated in place. The grouted surface when hardened and dried should be mopped with hot asphalt. As the mopping proceeds and before the asphalt has time to cool and harden, a layer of 15-lb. asphalt-saturated roofing felt should be placed on the mastic with edges of felt well lapped. Two layers of roofing felt are recommended with hot asphalt mopped between layers and also on top of the second felt. This membrane damp-proofing should be continuous over the entire floor area and carried up on the inside of the foundation walls to a point 1 in. or more above the finished floor level. Workmen must be cautioned against puncturing the membrane when placing the concrete floor.

Concrete for the floor slab should be made with durable, well-graded aggregate and should contain not more than 6 gal. of water for each sack of cement including the moisture contained in the aggregate. With average moist sand do not add more than 5 gal. of water per sack of cement. The mix should consist of 1 part portland cement to approximately $2\frac{1}{4}$ parts of fine aggregate well graded from $\frac{1}{4}$ in. down, and 3

(Please turn to page 184)



Fig. 2. Membrane damp-proofing completely covering grout-covered granular fill. Reinforcement for slab and also for beam under bearing partitions in place.

Fig. 3. Beveled sleepers for wood flooring being fastened to floor clips. Note metal duct for heating system.

Fig. 4. View of completed floor slab showing edge insulation strip and clips for sleepers.

Fig. 5. Sills for partitions bolted to floor slab. Plumbing is installed in partitions.



Wood & Relative Humidity (II)

W. LeRoy Neubrech, B.S., M.F.

N. Y. State College of Forestry

MOST people know that by humidity we mean moisture in the air. Such moisture may be suspended in the air in two forms, (1) as a fog or clouds, (2) as an invisible vapor. Insofar as our daily comfort is concerned and especially in connection with the gist of this article, we are concerned primarily with the second form, vapor, which is always present in the atmosphere in variable quantities.

The quantity of humidity or moisture in the air is most usually expressed in terms of "relative humidity," which is the percentage of moisture at saturation. To illustrate, air at 80 F can hold 11.0 grains of moisture per cubic foot when fully saturated or at 100 per cent, but if only 2.7 grains are present, the air is only one-

fourth saturated, or has a relative humidity of 25 per cent.¹

While temperature has some influence upon moisture content of wood at any given relative humidity of the air, its importance is not of sufficient significance to discuss in this article. It is enough to understand that the lower the humidity the faster moist lumber will dry and the drier it will become or vice versa.

Relative Humidity of the Open Air

While most people think of air-conditioning in terms synonymous with the cooling of our homes during the summer months, it is important to emphasize the fact that relative humidities in most parts of the United States are very high in the summer months. It is desirable, not alone from the standpoint of personal comfort but from a dollars and cents point of view in

¹ Acknowledgement is made to publications of the U. S. Forest Products Laboratory for the source of data for parts of this article dealing with the moisture content of wood in relation to the humidity of the atmosphere, the shrinkage and swelling of wood, et cetera.

relation to controlling the moisture content of the wood in our homes, to "air-condition" in the summer to reduce relative humidity, while in the winter we must add humidity, because most of our heating systems "dry out" the air in our homes. From the standpoint of personal comfort it is often recommended that the relative humidity in our homes should range from 40 to 50 per cent. If such a relative humidity can be maintained in our homes, wood will be held at practically an equilibrium moisture content and the damage done to wood products as well as our homes themselves due to shrinkage and swelling of wood would be greatly restricted.

Table 1 shows the variation in relative humidities in certain parts of the United States at different seasons.

Table 1—Average Humidities at Different Seasons in Certain Parts Of the United States ¹

Mean Relative Humidity Percent	New York City, N. Y.	El Paso, Texas	Salt Lake City, Utah	Seattle, Washington	Memphis, Tennessee	San Francisco, Calif.	Phoenix, Arizona	Madison, Wisconsin
Winter.....	73	45	73	83	74	79	47	82
Spring.....	70	27	52	73	69	79	32	70
Summer.....	74	41	36	69	75	84	32	71
Fall.....	75	46	51	81	71	80	41	75
Annual Mean.....	73	40	53	76	72	80	38	74

Heating Gives Air a Greater Moisture Capacity

It is common knowledge that when our homes and buildings are heated during the winter months there is a tendency for the relative humidity to drop off to a negligible amount, unless adequate provisions are made for meeting this problem. Warm air heating systems have made use of water pans and humidifiers with varying success according to some sources. Steam and hot water systems have not incorporated humidification devices in original equipment, but accessories have been developed to meet the need. The explanation behind the fact that relative humidity drops as air is heated concerns itself with the expansion of the air molecule as temperature increases. The result of this expansion is that there is greater capacity for moisture in the air.

Heated air, therefore, with a low relative humidity has a greater "moisture capacity," or tendency to absorb moisture from all available sources. Wood, being a hygroscopic material, will give off moisture under such conditions with consequent shrinkage, if it is above a point of equilibrium in moisture content.

Moisture in Wood Related to Humidity

It has previously been pointed out that there is a definite relation between the moisture content of

wood and the humidity of the atmosphere when the wood has come into equilibrium. The following graph (Fig. 1) shows by means of curves the moisture content of wood (in per cent based upon oven dry weight) at various stages of relative humidity (in per cent) at three different temperature levels. Taking, for example, the curve representing a temperature of 70 F, which is approximately the temperature in most of our homes during the period of heating as well as in the summer months, it will be seen that the moisture content of wood exposed to the air for a sufficient period to reach equilibrium, would contain a moisture content of 15 per cent at a relative humidity of 75 per cent, while if the relative humidity is reduced to 20 per cent the moisture content of the wood would eventually be reduced to about 4½ per cent. As will be shown in the following discussion, such changes in moisture content of wood cause appreciable shrinkage.

Shrinkage of Wood

A loss of only 2 or 3 per cent of moisture content in lumber as used for interior finish, floors and furniture, is sufficient to cause perceptible shrinkage. A discussion in detail of the properties of wood structure that cause wood to shrink would require a lengthy treatise. In brief, the amount that different species of wood shrink or that the same piece shrinks in different directions is principally due to the structure of the cells or fibers. Shrinkage across flat grain boards (tangential shrinkage) is much greater than across vertical grain or quarter sawed boards (radial shrinkage) and about one hundred times as much as along the grain (longitudinal shrinkage). The shrinkage across the flat grain of wood in particular accounts for the splitting, buckling, pulling of nails, or breaking of glued joints which frequently occurs when two pieces of wood are fastened together with the grain at right angles to each other. An example of this construction is the corner of a picture frame or a window or door frame. Shrinkage (or expansion) has been said to be the principal cause of all troubles in the handling of wood.

It is difficult to give an average unit of shrinkage per foot in wood in any one of the three directions above cited, as all species of wood shrink in different

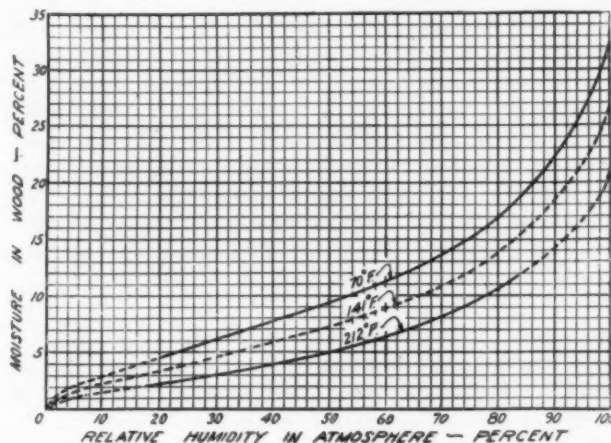


Fig. 1

¹ Taken from: Forest Products Laboratory publication "Relation Of Moisture Content and Drying Rate of Wood to Humidity of Atmosphere."

proportions. However, commercial white oak, which is a high class wood used to a considerable extent for flooring, interior finish and trim, doors, and furniture, has a characteristic shrinkage across flat grain (tangential shrinkage) of 9.3 per cent from green to oven-dry on dimensions when green.¹ As wood does not shrink above the fiber saturation point—this total shrinkage must then be confined between a zero moisture content and the percentage of moisture at the fiber saturation point. Assuming that the fiber saturation point of white oak is reached at a 24 per cent moisture content (which is about average for such hardwoods as have been tested) the indication is that if white oak shrinks 9.3 per cent or, for sake of ease in calculation, in inches, .093 inches per 1 inch in width, that it would shrink one-twenty-fourth this amount for a 1 per cent change in moisture content or about .004 inch per one inch width. It can readily be seen that even a 3 per cent change in moisture content in our hardwood flooring, a board being 2¼ inches wide, results in a total shrinkage of .027 inch. In the case of flooring, cracks even that wide are unsightly, but more important in the case of very narrow cracks is the fact that they allow dirt particles to fill them up, and when the wood again takes on moisture these cracks will be made wider. Further discussion on the development of flooring cracks will appear in the next article in this series, where it is pointed out the cracks in flooring are often formed by the flooring taking on excess moisture and expanding.

It must be borne in mind that a change of 2 or 3 per cent in moisture content in the wood in our homes is not uncommon as the relative humidity at 70 F needs to vary only about 20 per cent over a period of time to cause this amount of shrinkage. (Refer to Fig. 1) In many of our homes the range of relative humidity may be from around 20 per cent in the winter to around 80 per cent in the summer, allowing for a possible change in moisture content in wood at 70 F of around 12 per cent. Such a change would mean a shrinkage across the grain of white oak of about .048 inch for one inch in width, or .108 inch for flooring 2¼ inches wide, or a crack practically ⅛ inch wide. While such a moisture change in flooring means most unsightly cracks, it means damage of many other types in our wooden homes. To offer a very striking example of what cracks approximately ⅛ inch wide in hardwood flooring really amount to, if we take a room 14 feet wide it would mean a total possible shrinkage, (as just described on the basis of a change in moisture content of 12 per cent) across the room of over 8 inches if all the boards shrank across flat grain an equal amount. In other words, the total shrinkage of over 8 inches for the width of the room is the sum of the shrinkage of 74 flooring boards. Many explicit examples, with explanation of damage in everyday language, will appear in part III of this series.

Controlling Shrinkage

It has been shown that there is a definite relation between relative humidity of the air and the amount of

moisture wood will retain, as wood is a hygroscopic material. Secondly, it has been shown that wood shrinks or swells in accordance with its moisture content, and unless the relative humidity of the air is controlled, it is possible for wood in most of our homes to shrink or swell to such an extent as to cause serious damage.

It has likewise been shown that progressive manufacturers of lumber for the construction of our homes as well as manufacturers of furniture and other household articles of wood dry their products to a "mean" moisture content to meet as nearly as possible the average conditions of relative humidity in our homes and buildings.

It might be mentioned that most manufacturers of wooden household articles such as furniture dry their product to a point slightly below the expected equilibrium point, as it is considered wiser to have their products dried slightly under the point of equilibrium than over, to allow for moisture pick-up during manufacture and the time elapsed before the product reaches our homes.

Therefore, if we maintain our homes through air-conditioning, especially in the winter, but also during the summer months, at a more or less constant relative humidity of between 40 or 50 per cent which is considered most desirable for health and comfort, we will also be putting money back into our pockets by preventing damage being done to our homes and furniture through shrinkage or swelling of the wood out of which they are made.

Catalytic Gas Cracking

NEW AND IMPROVED PROCESSES for manufacturing gas, developed under intensive research programs carried on by the gas industry are now in operation, adding as much as 35 per cent to the peak load production of some manufactured gas companies. H. Carl Wolf, Managing Director, American Gas Association, announced lately. New methods of producing utility gas from fuel oils have passed the experimental stage and are now in production. Catalytic gas cracking plants are operating at Riverhead, Long Island, and Chester, Penn. Many other gas companies have established propane, butane and natural gas standby facilities for mixing with manufactured gas to meet peak loads.

Catalytic cracking, long associated with the oil industry, has now become an integral part of gas production. Recently the Long Island Lighting Co. opened at Riverhead, Long Island, the first catalytic gas cracking plant to attain full commercial operation for a utility in this country. Similar plants are to be built by Consumers Gas Co. of Reading, Penn. and the Harrisburg Gas Co. of Harrisburg, Penn.

This process, Mr. Wolf pointed out, represents a new approach to gas industry problems, not only in the type of gas produced, but also from the standpoint of flexibility and other economic factors. Now complete catalytic gas cracking plants can be installed at strategic points along the lines of manufactured or natural gas systems to produce and feed into the system gas of the same Btu value and gravity as that produced by other plants of the system.

¹ U. S. Forest Products Laboratory:—Technical Bulletin No. 158 "Comparative Strength Properties of Woods Grown in the United States."

Attic Fan Fundamentals

B. M. Aldrich *

J. R. Norton **

A presentation of the basic principles of engineering behind nighttime cooling with an attic fan is particularly timely at this season. This article was first published by the Engineering Experiment Station of Oklahoma Agricultural and Mechanical College at Stillwater.

ATTIC fans as a system used to provide relief from summer heat, usually consists of a propeller blade type of fan; an electric motor for driving; a grill covering an opening to the room space below the attic; a housing which connects the fan to the grill opening; and an outlet from the attic.

Attic fans use outside air, the temperature of which starts to decrease with sunset, to remove accumulated heat from the structure. This system is not to be confused with a system for air conditioning, which involves simultaneous control of temperature, humidity, air motion, distribution, and air quality.

In order to understand more completely the function of the attic fan in providing relief from summer's heat, some consideration will be given to the factors affecting human comfort. There are four vital factors:

1. Air temperature
2. Air movement
3. Humidity
4. Mean radiant temperature of the surrounding surfaces.

Effective Temperature

Varying combinations of air temperature, air movement, and air humidity induce the same feeling of comfort in the human body. These combinations may be plotted on a chart to show the relationship between them in producing an "effective temperature."

The term "effective temperature," in technical language denotes the sensory heat level or thermal balance of the human body. The relative degree with which each factor combines to produce any effective temperature may be shown by means of a chart. (See Figure 1.)

As seen from this chart, the effective temperature lines, drop diagonally downward and toward the right. Sensations of warmth and cold depend upon both wet and dry bulb air temperature. These temperatures are both shown on this chart. Dry air at a relatively high temperature will produce a cooler sensation than air with high moisture content but at considerably lower temperatures. A wide range of dry bulb-wet bulb temperatures and humidity percentage combinations produce the same sensation of comfort (effective temperature).

To illustrate: An effective temperature of 70° may be obtained under each of the following sets of values:

Relative Humidity	Dry Bulb Temperature	Wet Bulb Temperature	Effective Temperature
60%	74°	64°	70°
50%	75°	63°	70°
40%	76°	61°	70°
30%	77°	58°	70°

Warm air will absorb and hold considerably more moisture than cold air. Thus, during the warm summer months, the relative humidity percentage is comparatively low and the human body will experience reasonable comfort with considerable rise in dry bulb temperature. The lower the relative humidity the higher this dry bulb temperature may go without producing discomfort.

Air Movement

This factor has a powerful influence upon the thermal balance of the human body and is an important factor in the use of attic fans for residence cooling. Heat loss by evaporation is greatly increased by air movement and the radiation effects from surrounding objects (a function that varies as the fourth power of the absolute temperature) actually decreases with air movement. Air movement then has an appreciable effect upon the effective temperature as shown in Figure 2.

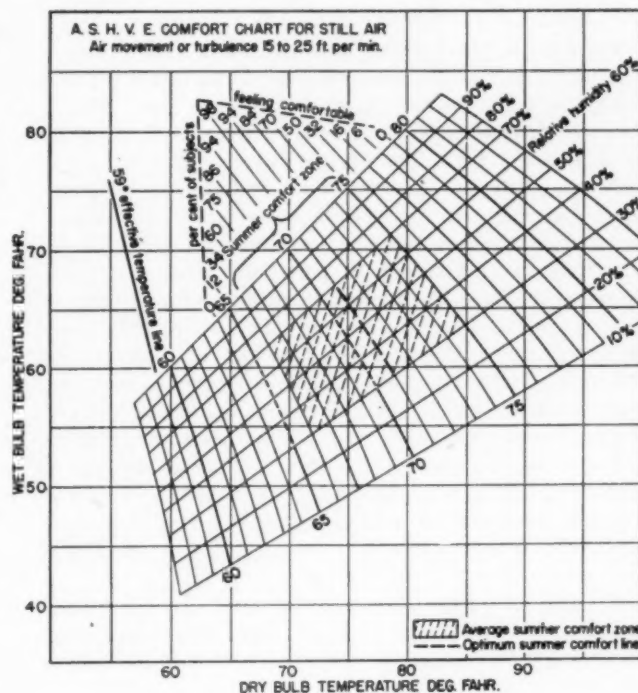


Figure 1

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** Assistant Professor of Engineering Research, Oklahoma A. & M. College

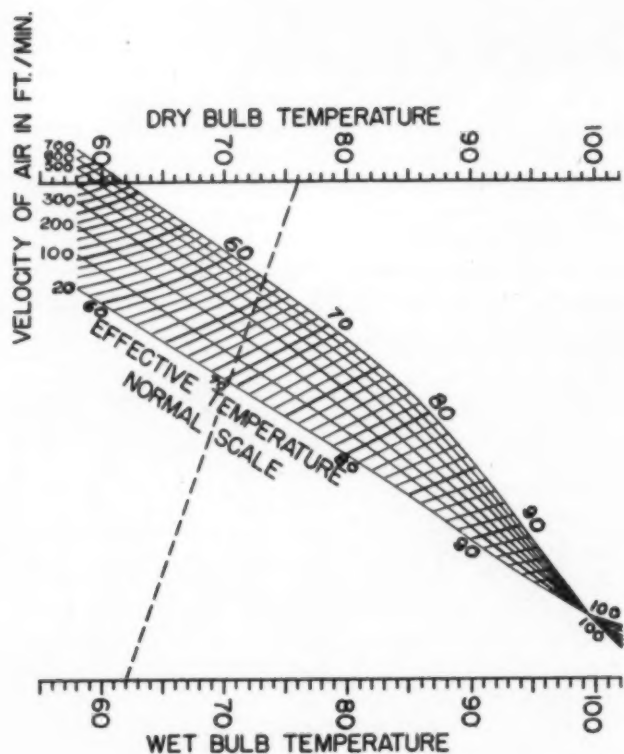


Figure 2

An examination of this chart reveals that the effective temperature lines rise diagonally and to the right as the air movement increases. Thus, by increasing the air movement, body comfort can be obtained at higher dry bulb temperatures. Velocities up to 40 or 50 feet per minute, if properly controlled, will not be objectionable when used in summer cooling. However as the temperature rises the effectiveness of air movement decreases and vanishes at about 100° effective temperature.

Temperature Lag

Time lag in the heating and cooling of a structure is another factor which must be considered in connection with the use of attic fans. During the heat of the summer day, outside air temperatures rise continually until about 4 p.m. The temperature of the structure rises also, but lags somewhat behind the temperature of the outside air. As evening approaches, the outside air gradually cools, but the heat already absorbed by the structure continues to penetrate into the living quarters, raising the temperature and producing discomfort over a longer period of time. This penetration will continue until there is a reversal of temperature difference between that of the structure and of the cooler outside air. At this point the structure will begin to give up heat and eventually cool to some temperature producing relative comfort. Without the use of an attic fan this delay in temperature adjustment carries over into the late hours of the night or even all night and temperatures are maintained that will not provide relief from discomfort.

As seen from the curves in Figure 3, the maximum temperature inside the structure was reached about 8 p.m. and by midnight the temperature was still about 10° above the outside air temperature. In case an attic fan is installed to pull in the cooler outside air, the

temperature difference is reduced to less than 4° at midnight, and it is possible to maintain the temperature within 2° of the outside air temperature. (See Figure 4.)

In most localities the temperature of the outside air drops toward evening into the region of comfort, but due to temperature lag (and heat absorbed by the structure during the day) conditions inside a structure remain too warm for comfort. With an attic fan in operation the cooler outside air is drawn through the structure at the rate of 20 to 60 renewals per hour, both lowering the temperature and giving movement to the air which contributes materially to the cooling effect and comfort. The quantity of air to be handled depends upon the sensible heat to be removed and this in turn depends upon the heat gain and the temperature of the entering air. However, air changes in excess of 45 per hour may produce high and annoying air velocities. An air change is defined as one volume or the cubical contents of the space subjected to the fan, of air drawn in and expelled from the space under consideration.

Keeping the windows open at night and during the operation of the fan will serve to pre-cool the structure and if the windows and doors of the structure are kept closed with the blinds pulled during the day, a decrease in temperature rise in the structure will be effected. If this temperature lag carries over toward evening then there is less accumulated heat to be removed and relief from discomfort is obtained in the earlier night hours. Openings in the attic to give a chimney effect to air currents, give satisfactory results in mild weather, but for extreme temperature conditions, this practice loses its effectiveness.

During the heat of the day attic temperatures may reach as much as 140° F. or more. Actual tests conducted at the University of Illinois indicates that little is to be gained by operating attic fans during the day to remove this high temperature air. Still air, especially at the surface, constitutes a good insulating medium and serves to reduce the heat penetration, as compared with penetration when warm attic air is scrubbing the attic roof surface. Air movement over any surface increases the rate of heat transmission and the net effect of operating the fan during the heat of the day is of little benefit outside the advantage gained by air movement.

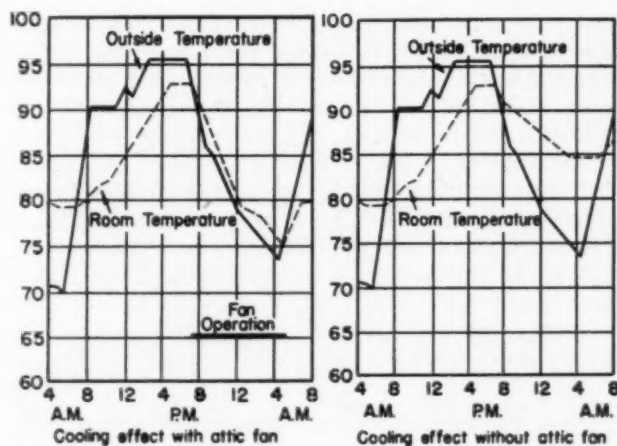
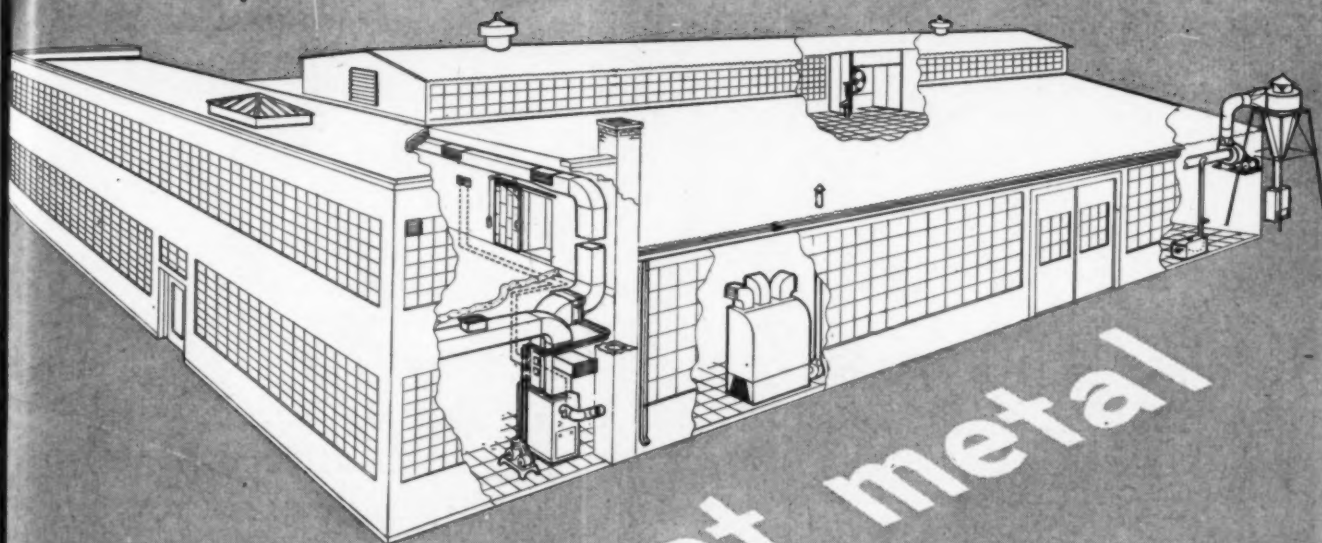


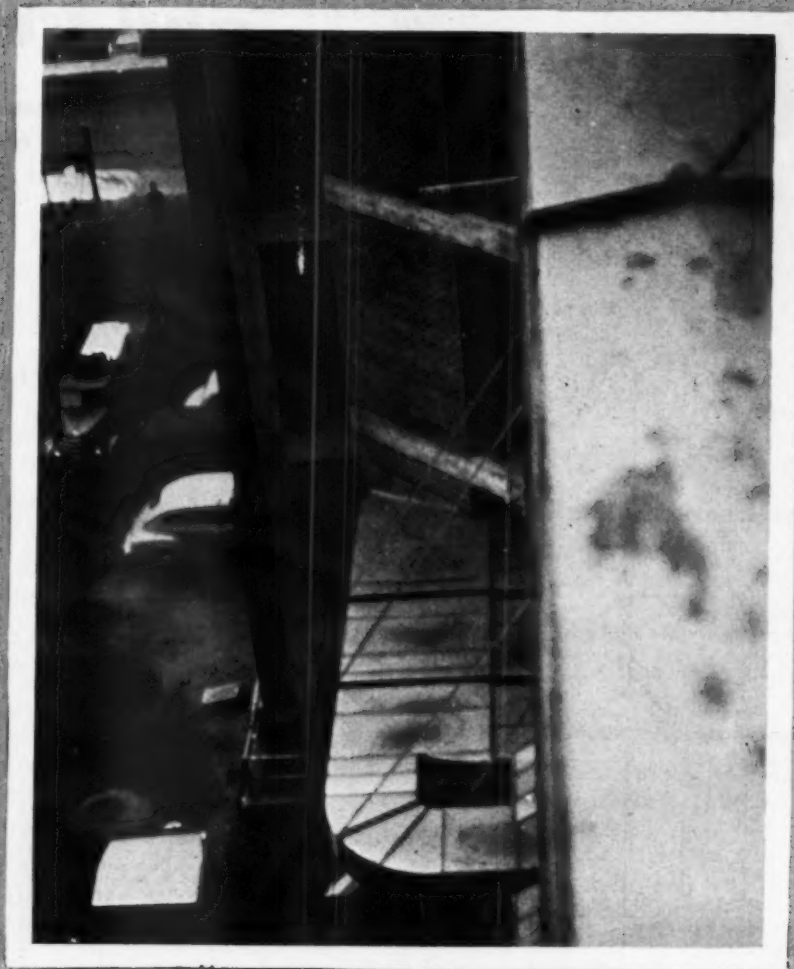
Figure 4

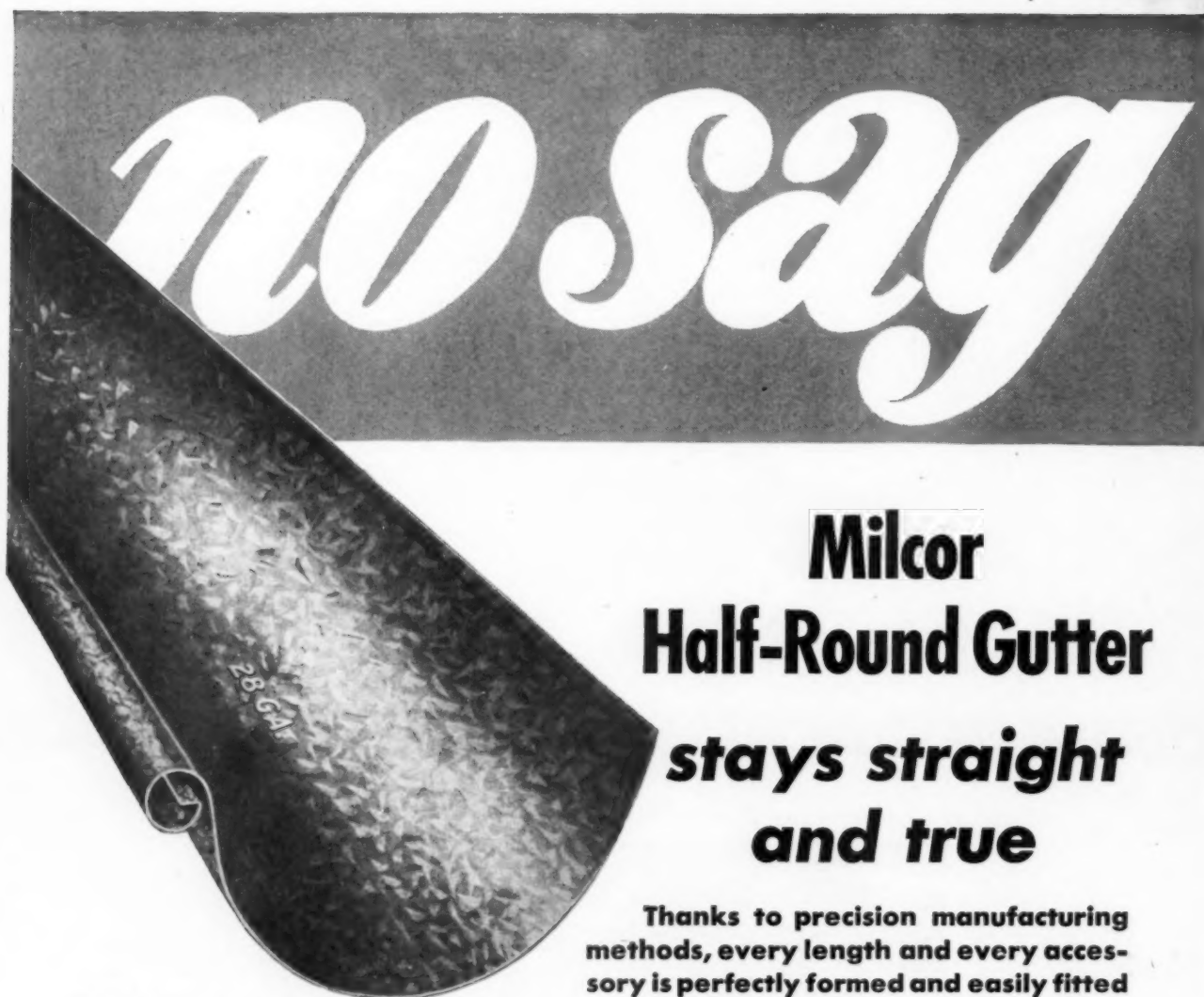
Figure 3



sheet metal *Section*

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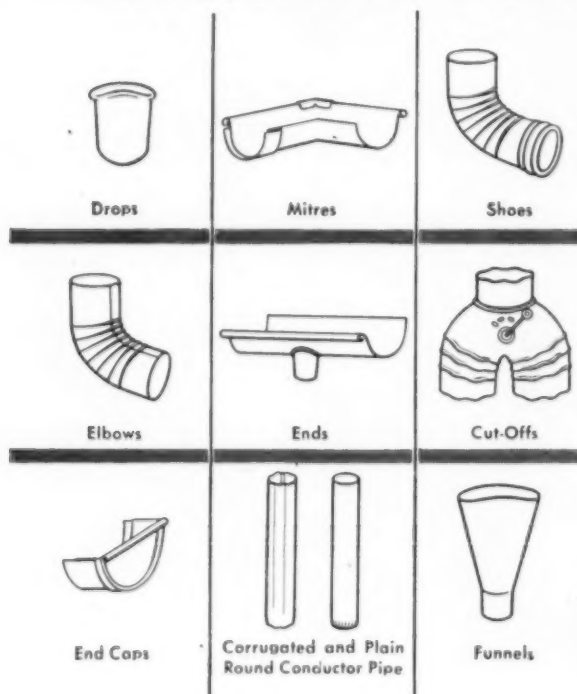
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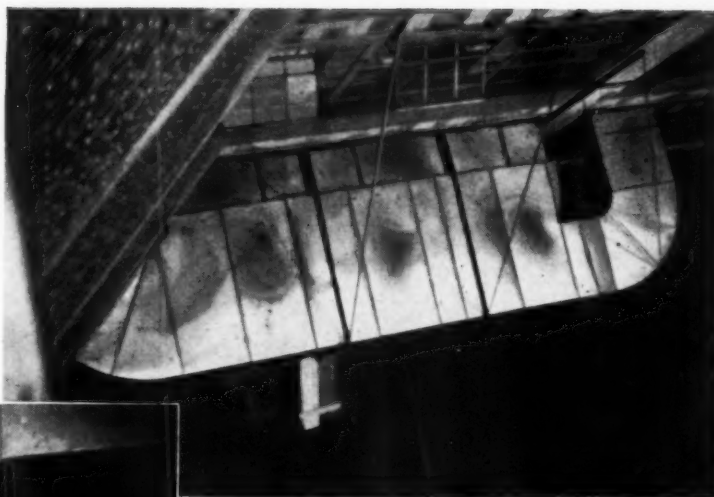
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Spencer Air Conditioning Company
Minneapolis, Minn.



In the process of manufacturing control equipment Minneapolis-Honeywell Regulator Co. finds it necessary to exhaust large volumes of dangerous fumes. The exhaust ducts are shown above and to the left. In the photo at the left the tempering air supply units can be seen beneath the stainless exhaust ductwork.

THE manufacture of automatic control equipment and instruments involves a series of industrial processes, such as die stamping, lead and plastic moulding, coil winding, and the production of mercury tubes and bi-metal elements. Completed units are made from a number of parts, many requiring metal finishing.

In the Minneapolis-Honeywell Regulator Company plant at Minneapolis, the metal finishing department covers an area of approximately 30,000 square feet, an indication of the importance of this process. The metal finishing consists of spray painting black wrinkle, bronze, and silver finishes on covers, plates, and other parts for instruments and control devices, and plating chrome, cadmium, and other acid process finishes for a variety of items.

Ventilation Safeguards Health

For both processes an efficient and effective system of ventilation is required to safeguard the health of the operators. Also, there is the ever-present hazard of fire and explosion in the operation of paint and lacquer spray equipment.

The acid plating process presents the problem of designing an adequate system for the exhaust of dangerous fumes and the supply of fresh outside air to replace that which is exhausted. In the Minneapolis-Honeywell plant, 115,000 cfm is exhausted from the plating department to insure removal of the contaminated air from the range of respiratory intake. This air is exhausted through slotted hoods mounted on the

plating tanks, drawing the fumes and vapors away from the operators. A supply of clean, tempered fresh air is circulated in the vicinity of the breathing level.

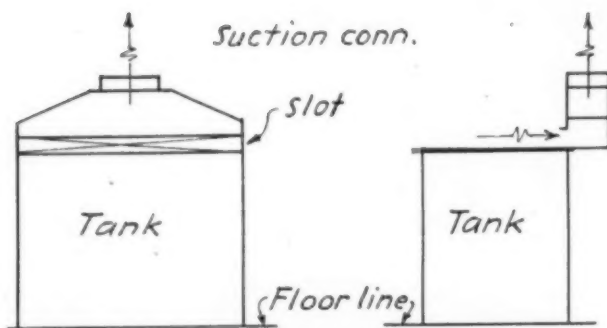
Eighty-five per cent of the exhaust air is replaced by outside air. This unbalance between supply and exhaust creates a negative pressure (suction) in the plating area and prevents exfiltration to other parts of the building. Instead of exfiltration, infiltration from other departments occurs, making up the 15 per cent deficiency in the supply air.

The supply air is tempered by passing through non-freeze steam coils arranged in two separate one-row coil banks, each of which is automatically controlled to warm outside air to 65 F during winter operation.

Five tempering coil units were installed on outside walls to provide the volume of fresh heated air required for the department. Since most of the wall surfaces are glass and steel sash construction, it was necessary to utilize the upper portion of these windows to accommodate the supply units.

The outside air intake of each supply unit is equipped with two automatic louver-type dampers operated by pneumatic motors. Each motor is actuated by an electro-pneumatic relay wired so the damper is in an open position during fan operation and closed when the fan stops.

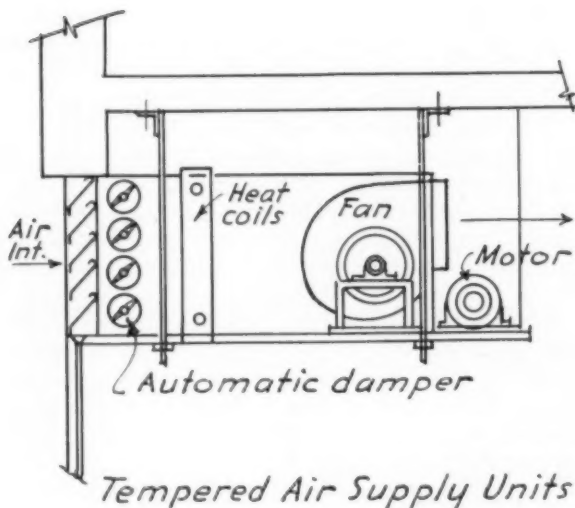
The control system consists of modulating steam valves, installed in the steam supply lines, actuated by temperature controllers located in the fan discharge. The system provides for tempering the supply air



*Detail of Exhaust Chamber
for
Plating Tank*



*Detail of Double Chamber
for
Long Plating Tanks*



Some interesting details of construction are shown in the drawings above. The slots exhausting the plating tanks are an effective application of fume removal equipment. On the opposite page are shown relative location of exhaust ducts and supply units and control details of the tempering units

whenever the outside temperature is below 60 F.

Adjustable diffusers permit deflection and distribution of the supply air in both the horizontal and vertical plane.

Each supply unit is equipped with a fan sized to overcome the static resistance of the coils and intake dampers, and is operated by a 5 hp motor with V-belt drive. Each has a capacity of 20,000 cfm and heating capacity to raise this volume of air from its outside temperature to 65 F.

The supply units are started manually by push-button switches wired to automatic, magnetic motor starters.

Design of the Exhaust System

An installation of this size requires particular care in designing and sizing the exhaust system, especially the mains, branches, and tank exhaust chambers. A detail of a tank exhaust chamber, typical of the design used in this installation, is shown.

The exhaust air requirement for each tank is based on 125 cfm per sq ft of top liquid surface area. Velocities through the slots in the hood tanks approximate 1500 to 2000 fpm; hood connections, 1500 fpm; branch mains, 1800 fpm; and main ducts, 2000 fpm.

Volume control dampers are provided in each hood connection for balancing the volume distribution of the system.

Connections between the tanks and ductwork are insulated with $\frac{1}{8}$ in. thick sheet rubber to prevent shorting of circuits wherever the tanks are equipped with electrical apparatus.

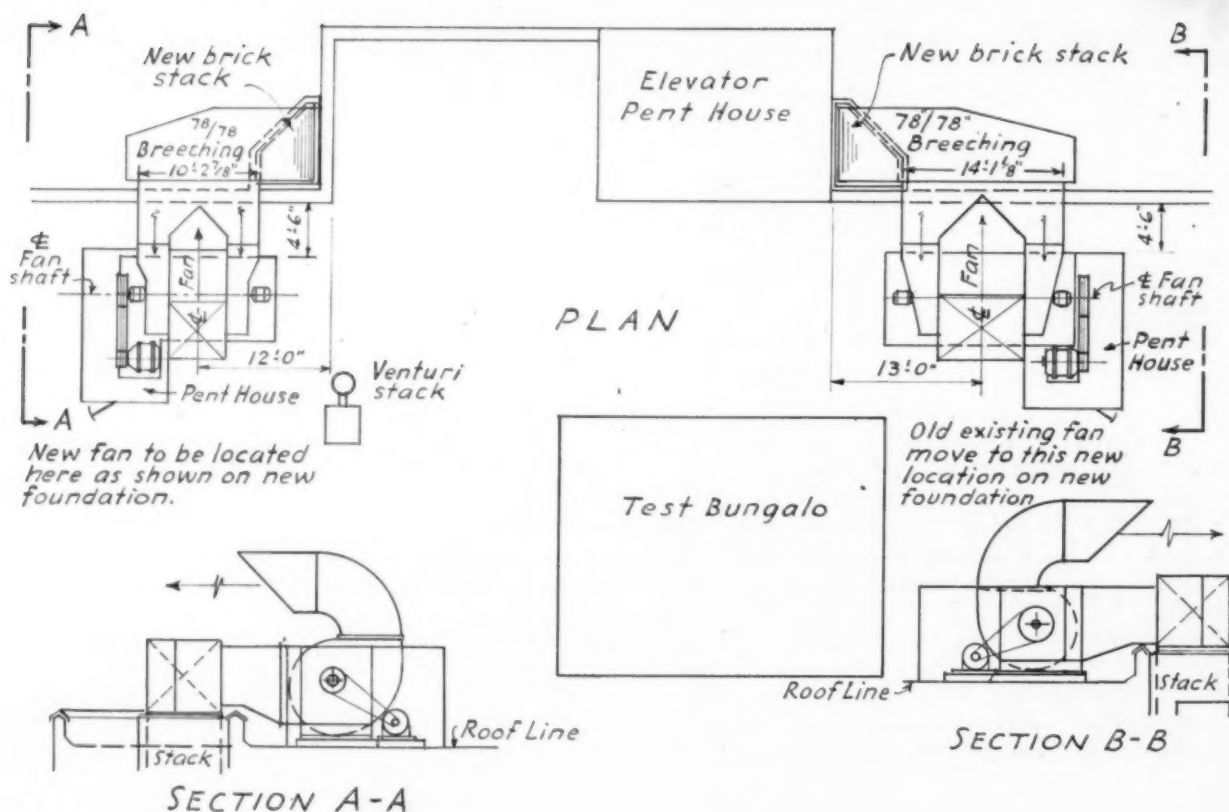
Since the plating department is located on the third floor, and due to the extent and size of the equipment and installation, it was necessary to locate the exhaust fan on heavy reinforced concrete foundations on the roof over the sixth floor of the building. This necessitated the construction of an acid-resisting brick-lined stack on the outside of the building, from the ground to above the roof, to connect the exhaust ductwork on the third floor to the fan on the roof.

Stainless Steel Ductwork

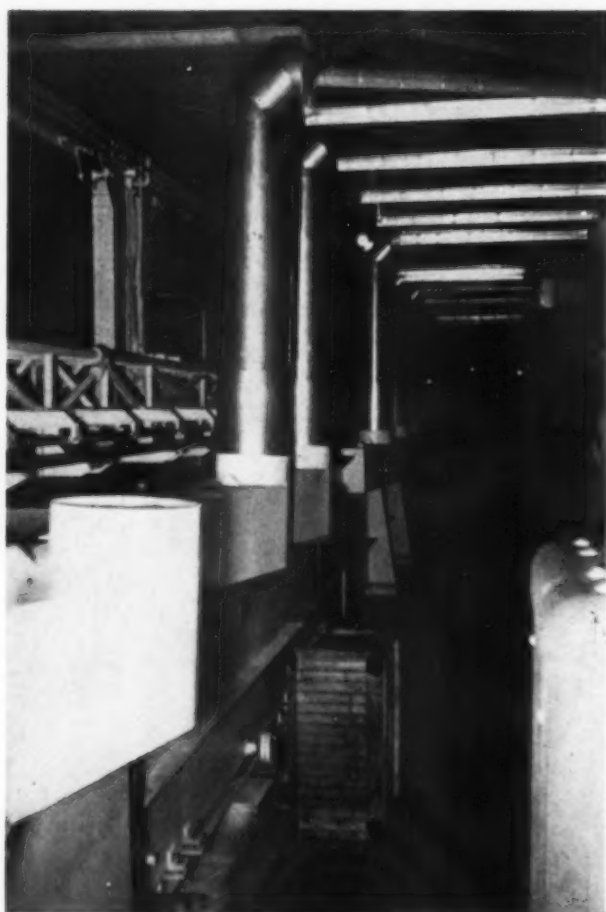
The corrosive qualities of the acids used in the plating process made it necessary to fabricate all the ductwork of the exhaust system from stainless steel sheets. The large stack breechings (connecting the stack and ductwork on the third floor and the stack and fan on the roof) and mains are 18 ga. and the branches, 20 ga. All reinforcing material such as angles, rivets, bolts, and metal screws are also stainless steel.

The entire interior of the fan housings and breechings as well as the wheels and shafts were treated with a rubber base coating to resist corrosion. Condensate drains in the housings, stack breechings, and stack carry away any accumulation of water which would absorb acid from the fumes, another corrosion preventative.

The exhaust fans are extra heavy, double width, double inlet construction, equipped with connections to the main stack as shown in the illustrations. Each operates at 3.5 in. static pressure and is driven by a heavy duty 40 hp totally enclosed motor with V-belt drive. A sheet metal lean-to penthouse was erected at the side of the fan housings to enclose the motor and



Plan above shows how the existing exhaust fan was relocated and a new one installed. Photo below illustrates exhaust chambers detailed on page 100.



drive equipment. These were provided with screened air intakes and roof ventilators for motor ventilation.

The fans are started automatically from remote push button stations located in the plating area and wired to the holding coil circuits of automatic reduced voltage, primary resistor motor starters located in the motor penthouse on the roof.

A separate dust collecting system is installed to serve the buffing and polishing machines. This system consists of hoods enclosing the buffing wheels and connected to a high suction exhaust fan which discharges into a cyclone dust separator. A suction of 2.5 in. at the 5 in. diameter hood connections removes dust and lint from the buffing operation.

Spray Painting Ventilation

The spray painting and bronzing areas are equipped with conventional spray booths used for applying the finishes on covers, plates, bases, etc. These booths are equipped with propeller fans driven by explosion-proof motors. Each booth is connected by an independent exhaust duct to a common exhaust stack which discharges through the roof of the building. Each fan has a capacity of 3000 cfm at 1/4 in. static pressure which is required to produce a face velocity of 175 fpm over the open, cross sectional area of the booth.

All of the sprayed metal parts are racked and run through a continuous conveyor type, drying oven which is equipped with gas-fired heat transfer equipment and served by an independent air circulating system for the drying process.

A general room exhaust system is installed to serve the hooded dip tanks and spray mixing room, and to

(Please turn to page 188)

SHOWMANSHIP

In Stainless Steel

R. C. NASON

Long Island, N. Y.



ONE of the finest assets that a public eating place can possess is a spotless kitchen that can be put on display for the curious, as well as the suspicious, to see. When the kitchen and food service equipment is fabricated of gleaming, attractive stainless steel and is so planned that the diner need not leave the dining area to observe the faultless conditions under which his meal is prepared, then the selling point of a clean kitchen is greatly enhanced. Gallagher's Steak House in New York City installed a new kitchen and the contractor, S. Blickman of Weehawken, N. J., used 10 tons of chromium-nickel stainless steel in revamping the kitchen facilities of the restaurant. This does come under the heading of "selling the sizzle" but the restaurant feels that the favorable comment resulting from the installation has more than offset the cost.

The scope of the job is indicated by the fact that one stretch of ranges and cabinets is 45 ft long and

none of the 18-8 stainless steel in the entire installation is lighter than 18 gauge. In addition to fabricating the equipment needed the contractor also surfaced the walls and ceilings with stainless sheets. And in order to eliminate the smoke and odors ever-present, an exhaust hood was erected over the ranges and charcoal broilers that was a full 28 ft long and had provisions for the use of a double row of filters installed at a 45 deg. angle.

A more specific list of the equipment manufactured for the job might prove of interest as an indication of the variety of items needed. Two very large refrigerators were made, three hot dish cabinets, two steam tables, a charcoal broiler, several work tables, three large coffee urns, two deepfat fryers, cracked ice bins and a special sink as well as many more minor pieces and utensils. The ranges and ovens were procured from an outside source and installed by Blickman.

Some of the construction details and specifications indicated a planning for utility that should be present in all installations of this nature and especially where the work of the contractor is likely to be exposed to the public gaze and can be a good source of publicity and an aid to his reputation. There are no sharp edges at all in the entire kitchen and the generously rounded corners not only eliminate any chance of injury but also contribute to the ease with which the area can be kept in shining, spotless condition. Another example of good planning is the fact that the hot dish cabinets have openings in their shelves to allow the heat to distribute itself more evenly and avoid any hot or cold spots. All sliding cabinet doors roll on roller bearings since a sticking cabinet door can be a considerable irritation when a lot of hungry Gothamites are clamoring for their steaks. The ranges are equipped with tops of Ni-Resist, a nickel cast iron that is designed to prevent warping or rusting and shelves which are above counters are supported by legs of stainless steel tubing. The major pieces of equipment are mounted on forged legs for greater sturdiness.

As indicated in the opening paragraph of this article the idea of exposing the kitchen to the view of the diners derived from a desire to sell by showmanship, and another piece of equipment that adds to this sales-showmanship is the huge refrigerator which stands near the entrance to the Steak House. It is 14 ft long and 7 ft 6 in. high and has clear glass doors that allow the incoming customers to whet their appetites by gazing upon thick, succulent steaks and chops. During times of shortages of meat, when many patrons were unable to get meat for their tables at home, just the mere sight of the steaks was calculated to increase sales. A decorative note and yet one in harmony with the surroundings is the presence on the walls of oil paintings of a number of champion, pure-bred Angus cattle that the owner of the restaurant has raised on his large farm.



Fig. 2. One of the features of the installation is the fact that the range tops were made from NiResist, a nickel cast iron that is designed to prevent warping or rusting.

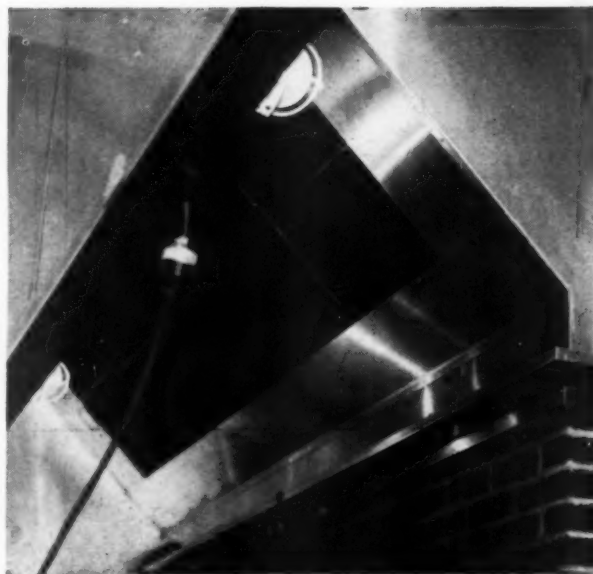


Fig. 1. A view of the filters as installed over the charcoal grill in the Steak House.

The serving counter opposite the charcoal broiler is only 30 in. high, designed to make it possible for the diner to watch the entire process of transforming the raw steak into a meal cooked to just the right point to satisfy the palate of the individual diner. As a means of keeping the atmosphere as clear as could reasonably be done the range exhaust hood was brought down to within 24 in. of the charcoal broiler thus making it quite difficult for any smoke to escape into the dining area. As mentioned before this exhaust hood was fabricated from the same weight of stainless steel as the rest of the job and the ease with which it is kept clean is especially noticeable in this location.

A large exhaust fan was located on the roof in a housing and from there drew the smoke and odors out thru the filter banks. As indicated in the draw-

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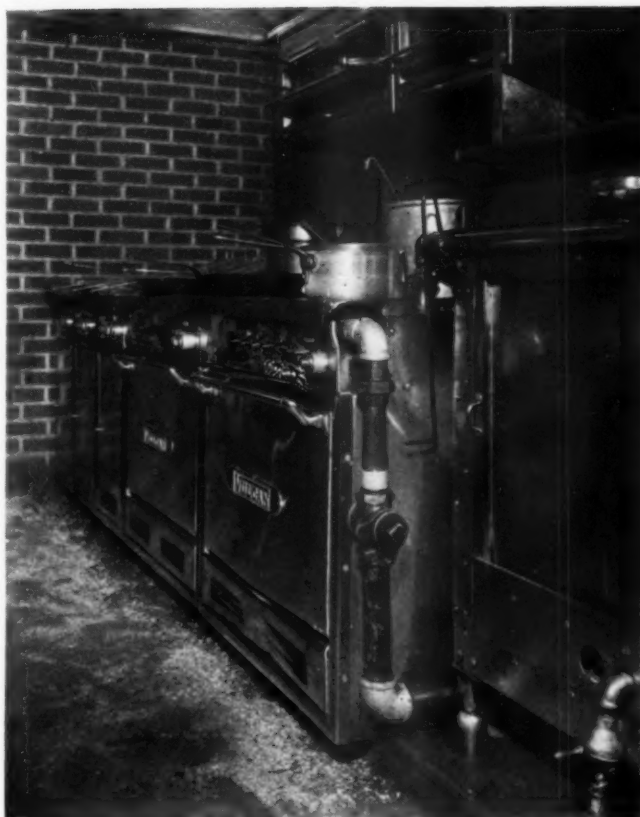


Fig. 3. (left) Some of the detail work that went into the installation can be observed here.



Fig. 4. (right) The larger filter bank that is over the ranges is shown in this photo.

ing three grilles are located in the ceiling of the kitchen area and the air supplied by these grilles along with the air drawn in from the dining area make up the volume necessary to replace the air exhausted. The purpose that is accomplished by this setup is the establishment of a flow of air in the direction of the kitchen, out of the dining room, to assure containment of the cooking odors in the kitchen. With the amount of smoke and grease passing thru the filters in this type of installation it becomes essential to clean them weekly and the filter banks were installed with that need in mind so removal and replacement of filters is easily accomplished.

In determining the filter installation a division was made that split the area into two sections; one, over the ranges was 180 sq ft and the other, over the broilers amounted to 50 sq ft. In selection of a filter size a decision was made to use a filter that was 18 in. wide and 30 in. long, and as a result the bank over the ranges consisted of eight sections of filters and over the broiler five sections were used.

In sizing the exhaust fan a sensible approach was taken and there was no attempt made to secure a high velocity of air moving thru the hood but merely enough to make sure that all odors would be removed. The velocity used in these calculations was 150 feet per minute. The square footage of filter area added up to a requirement of 7,312 cfm for the fan to move and it was sized accordingly.

The main purpose in presenting articles of this type is to show the things that can be accomplished

by "selling the sizzle." Just as a soda fountain clerk may ask "One egg or two?" when he prepares a milkshake for you, it becomes good sales policy to offer a prospect a choice of alternatives that both offer an opportunity for you to do some work for him. Don't give him a choice between having you do *some* work for him or *none* but rather make his choice lie between having you do *more* work or *less* for him.

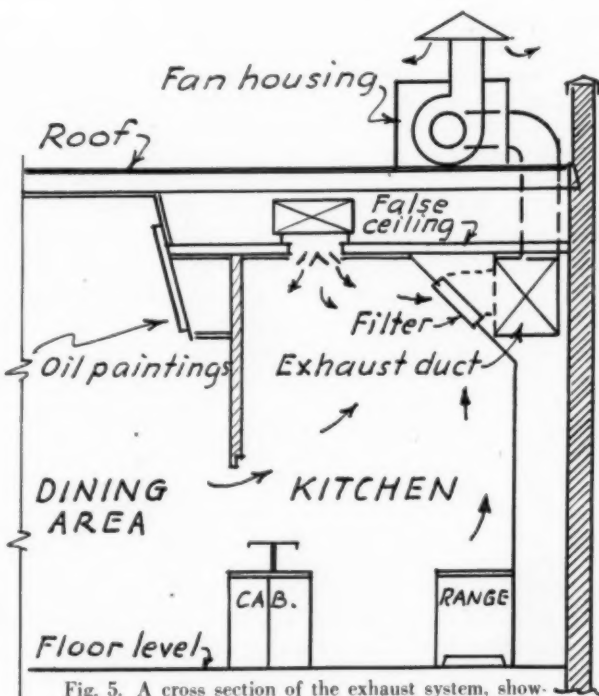


Fig. 5. A cross section of the exhaust system, showing duct placement and the roof fan housing.

Design of Waste Removal Systems

(Part VII)

By H. M. Nichols

Industrial Dep't., Sturtevant Div.,
Westinghouse Electric Corp., Hyde Park, Mass.

These articles are adapted from a series of lectures that are presented in the Sales Engineering School of B. F. Sturtevant Co. Their application of basic principles is so sound as to be of value to any sheet metal contractor handling this type of work in any good volume.

FOR centuries past the conveying power of air in motion has been utilized to move sailing vessels and turn the wheels of windmills, but it is only in comparatively recent times that this natural force has been utilized for the conveying of bulk materials.

Air in motion, or wind, has been moving dust, leaves, sand, pebbles, and similar materials through all ages, and while it is impossible to estimate the total weight of such materials moved from one place to another by air currents, since the earth's creation, it would certainly total many times the weight of all materials which man has transported in various ways since the beginning of time.

Only some 80 years ago the first practical use of an air-blower for conveying materials was made. This putting air to work was the outcome of an automatic shoe peg machine invented by Mr. B. F. Sturtevant, which produced pegs in such quantities that they clogged the machine, and it was necessary to devise automatic means for taking away the product as fast as it was made. Mr. Sturtevant conceived the idea of removing these pegs with a blast of air from a small blower which he invented, and thus came into being the first practical pneumatic conveying system.

Uses for Pneumatic Conveyors

Pneumatic conveyors find their widest field of usefulness in those situations where mechanical conveyors are impractical because of structural difficulties, lack of room, or excessive first cost, compared with the amount of material to be handled. The characteristic advantages of pneumatic systems are: A much lower initial cost than mechanical conveyors (where moderate quantities of material are to be carried a considerable distance), low maintenance expense, and a wonderful flexibility of plant whereby all obstacles such as roads, rivers, railroads, buildings, machines, etc., can be overcome without difficulty. All jobs are

alike to the pneumatic conveyor. It will shoot the material around corners, up or down, anywhere you lay the pipe. Other advantages are: automatic features, economy in labor, elimination of dust and its harmful effect on employees and machinery alike, protection of the products from exposure and loss while in transit, reduction of accidents, and fire hazards, reduction of number of moving machine parts and the concentration of these parts at some convenient place where they can be most easily taken care of.

Balanced against these many advantages we have the undeniable fact that air conveyors consume more power than any of the purely mechanical contrivances. However, by careful engineering it is often possible to keep the additional power cost down to a small fraction of the savings which result from reduced interest, maintenance, labor, and other operating expenses.

Pneumatic conveyors are successfully handling a wide variety of materials ranging in size from sawdust to wood chips and blocks, and in weight from feathers to metal chips. It should be kept in mind, however, that pneumatic conveyors of the conventional suspension type are, of course, limited to the handling of bulk materials, and that they are also restricted to such materials as will pass through the piping system without clogging, and to such materials as can be readily separated from the conveying air at the discharge end.

Blow Through Conveying System

The most common and simplest type of pneumatic conveyor system is the blow through system wherein material is fed into a hopper in the suction pipe and is then carried by the air stream through the fan and delivered, together with the conveying air, to the collector or separator (Fig. 1). At this point the material is separated from the air, the air is discharged to the room or atmosphere and the conveyed material is de-

livered to storage or process by means of a gravity spout. Materials such as wool and waste paper are usually blown directly by the fan into storage bins, which have the upper portion screened to allow the escape of the conveying air, thus eliminating in most cases the use of a collector or separator.

Draw Through Conveying System

Materials that would be injured in passing through a fan wheel or materials that would damage a fan are handled on the draw through principal (Fig. 2) where the fan follows the collector which is consequently under suction and hence requires an air-tight seal in the material discharge spout, usually provided by a rotary valve, or storage chamber with double blast gates. Materials of this type may also be handled by blow through pressure feeding (Fig. 3) or by injector. (Fig. 4).

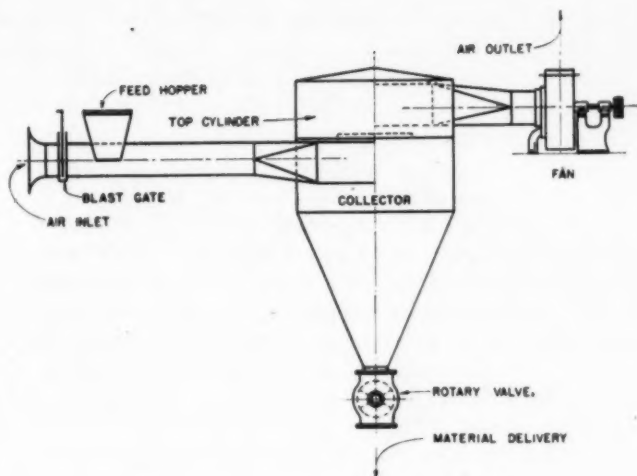


Fig. 2. Draw through conveying system.

Blow Through Pressure Feed Conveying System

In this system (Fig. 3) the material is fed into the air stream near the fan outlet by means of an air-tight rotary valve located in the discharge line near the fan

Materials Conveyed

Among the materials conveyed with pneumatic fan systems are raw and ginned cotton, wool, hair, flax, shoddy cut rags, and feathers. In the wood industry there are shavings, chips, sawdust pulp chips, bark etc.

In the metal industry we have cast iron chips and borings, crushed steel chips, aluminum and brass chips.

In the felt and leather industry there is wool, fur, felt scrap, tan bark, and leather scrap.

In the food industry grains are usually handled by mechanical conveyors although there are special applications where grains are handled pneumatically. Other applicators in the food industry are cotton seed, meat scraps, bran and copra.

Other materials conveyed pneumatically are waste paper, soap, pulverized coal, rubber scrap, jute, hemp, sisal, synthetic fibres, granulated cork, asbestos, tobacco leaf and stems.

Pneumatic conveyors of the low pressure fan type which move the material suspended in the air stream find their widest field of use in the conveying of light, bulky materials such as cotton and wool.

Collectors or separators are designed primarily for separating the conveyed material from the air stream. Suitable storage hoppers or means of continuously removing the separated material from the collector should be furnished. Under no circumstances should a

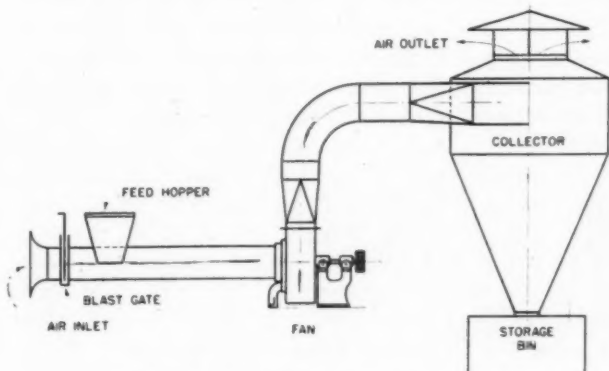


Fig. 1. Blow through conveying system.

outlet. As in the blow through system, the material is discharged from the collector by means of a gravity spout.

Injector conveying system (Fig. 4). Material is introduced into the discharge line by means of an air injector. The injector method of feeding is rarely used because of the low efficiency of the injector unit, however, this system is well adapted for conveying materials which cannot be successfully fed into the system by mechanical means which cannot be handled through the fan.

In the pneumatic conveying of materials containing fine or light dust particles which are to be removed from the conveyed material, or which would constitute a dust hazard if discharged at the delivery end of the average collector, the use of a secondary collector is often required. (Fig. 5). This secondary collector may be a cloth screen arrestor, air washer, scrubber, or other comparable device. Also pneumatic conveying of materials is limited to the handling of such materials as may be safely passed through the pipe lines at relatively high velocities without injury. Systems which pass the materials through the fan are also limited to such materials as will pass the fan wheel without injury or clogging.

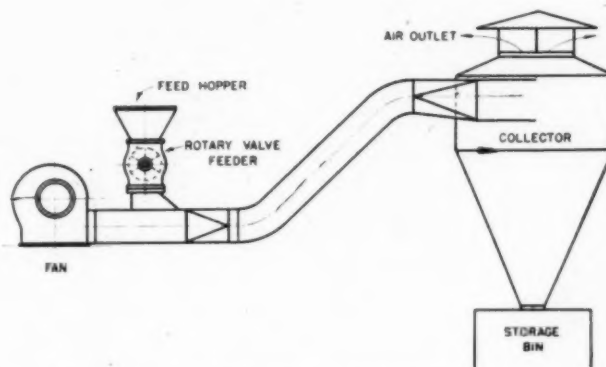


Fig. 3. Blow through pressure feed conveying system.

cyclone collector or separator be used as a storage hopper.

Materials which have a tendency to stick in the conveyor pipes or fans and materials which are easily damaged require special care in the application of pneumatic conveying. Hygroscopic materials such as salt and raw sugar and such materials as silk, rayon, grease wool and wool heavily loaded with oil emulsions all have a tendency to adhere to the pipe and fan. Fan wheels of special design are always required to convey cotton, wool, paper trimmings and similar materials. Pulp chips, ground cork, etc, if conveyed through the fan are often broken and desized to varying extents. Wet wool is felted if passed through a fan wheel and for that reason is seldom handled pneumatically. In the colder climates the outside of all conveying pipes should be insulated to prevent condensation of moisture within the pipes and the subsequent freezing and clogging of the system.

Technical Design

Two factors are involved in the design of pneumatic conveying systems—namely, necessary air velocity to keep the conveyed material in suspension and in motion in the air stream and also quantity of air required to move the given amount of material. Once the air velocity and quantity of air has been determined it is a simple matter to determine the pipe size, static pressure, and fan performance.

Conveying velocities. Minimum transporting or conveying velocities are dependent on a number of factors such as the surface condition of the material (sticky materials require higher velocity than normal), the size and shape of the particles to be conveyed, and the apparent density of the material in the condition in which it is to be conveyed. If the material contains moisture, always use the total weight in determining the air volume and velocities.

It can be stated as a general rule that the required transport velocity increases with an increase in density of material, and it also increases with an increase in the particle size. This relation is expressed in the following equation covering the air velocity required to lift a spherical particle:

$$V = 15,000 \left(\frac{C}{G+1} \right) \sqrt{D}$$

V = Air Velocity, feet per minute

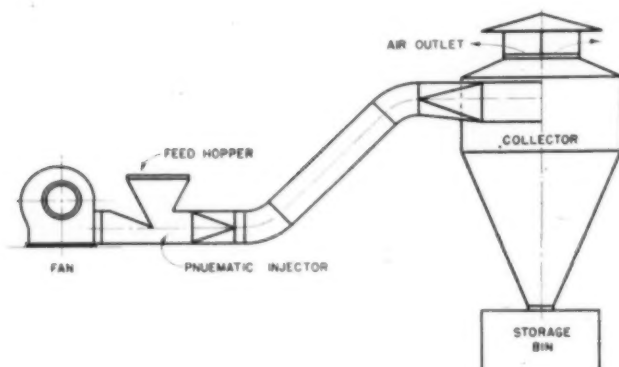


Fig. 4. Injector conveying system.

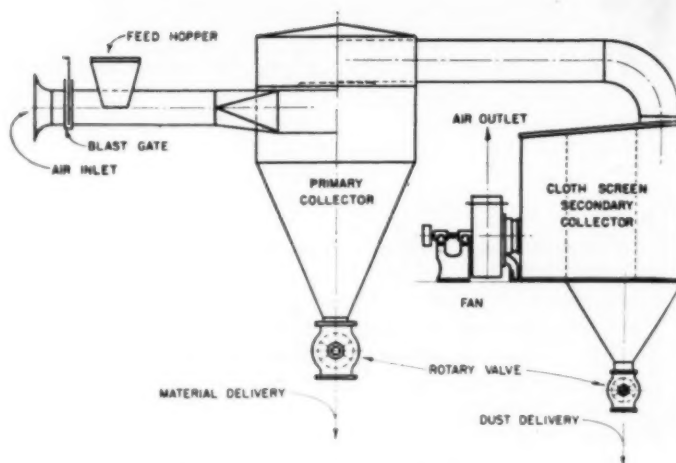


Fig. 5. Draw through conveying system.

G = Specific gravity of the material
D = Particle diameter in inches.

In practice it is customary to make no distinction between the velocities required for vertical and horizontal transport of materials and to maintain a minimum velocity of 3,000 feet per minute in any case. However, when higher velocities are used, the transporting power of the air is increased only moderately and there is no appreciable reduction in the cubic feet of air required to convey a pound of material.

The latter statement applies to conveying velocities in the normal range of low velocity suspension conveying, say up to 15,000 feet per min. The exact figure depending upon the density and type of material. Above this limit there is an abrupt change in the conveying constants somewhere in the range of 15,000 to 20,000 feet per minute, resulting in a material decrease in cubic feet of air required per lb. of material.

Air Volumes

Air Volumes Per Pound of Material Conveyed—As a general rule it can be stated that in pneumatic conveying with a low pressure, low velocity system, the cubic feet of air required to convey a pound of material (at velocities ranging from 3,000 to 7,000 feet per minute) varies from approximately 100 cu. ft. of air per pound for light fluffy material such as open cotton to about 35 cu. ft. of air per pound for heavy solid materials. The weight used is not the true density of material but is the average bulk weight of a cubic foot of material in the condition in which it is to be conveyed. If material is moist, the bulk weight of the wet material must always be used.

Feeding Device Needed

Feeding Devices. Fan conveyors are not self-feeding. They must be fed by hand or by some mechanical means. Cotton and wool are usually handled directly from the opening machines to the suction hoods, while in the case of dryers, the material is dropped from the dryer apron into an open suction hopper. Chips and granular materials may be fed to the conveyor pipe by a rotary valve, belt, screw feeder or other mechanical means.

Tools and Their Uses

A series dealing with the various tools that are used in and adapted to sheet metal work. The articles will discuss common uses as well as unusual applications that may not be familiar.

By Ernest E. Zideck
Sheet Metal Consulting Engineer

Brazing-Welding Methods

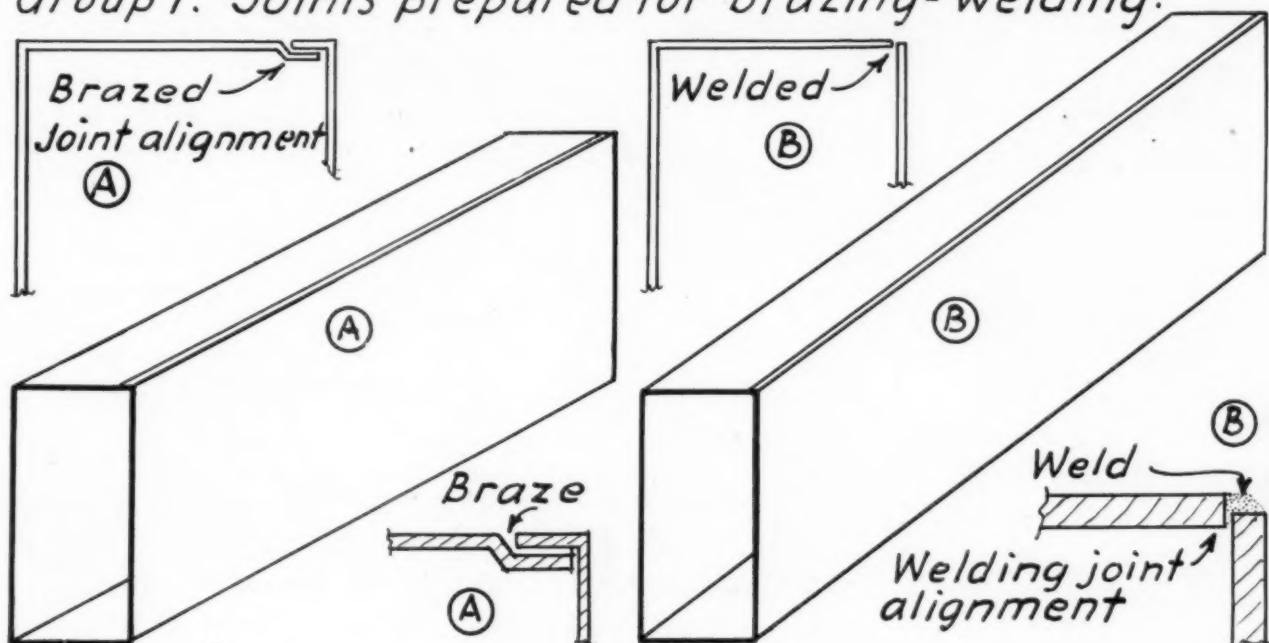
AS THE gauges of metal worked in the contemporary sheet metal shop increase in thickness; and wrought shapes of iron and steel are used in framework, industrial items and housings for air conditioning and other uses; the older methods of joining metal by seams, laps, soldering or riveting, or by a combination of seaming-soldering and riveting-soldering, give way more and more to brazing, spotwelding, flame welding or arc welding. On heavy frames this latter method, arc welding, is perhaps the best joining method, although flame welding can be used for the work. Arc welding (if the welded joints are hidden from view and the rough weld need not be finished off) takes less time than flame welding. This kind of welding we shall discuss here as we proceed with this text.

For any kind of a welding or brazing job, the use of

hold-down jigs and fixtures is a pre-requisite, unless we are handling only one or two similar small jobs, which we can hold in position for brazing or welding by common clamps. But, whenever more than three pieces are to be made and dimensions are to correspond, the work can be done more quickly and accurately by making a jig or fixture for the job. Any experienced welding mechanic knows that metal is bound to move under flame; and if it is not restricted by clamps or other means, the product may be inaccurate and costly. Most jigs and fixtures are not difficult to make and can be produced in the sheet metal shop with the normal complement of equipment.

In the drawing, Group 1, we show (A), a *brazed-joint*, square duct; and (B), a *welded-joint*, square duct, both long enough to make clamping of the metal mandatory. The usual procedure of tacking the metal-

Group 1. Joints prepared for brazing-welding.



edges first is a tedious job, and carries no guarantee that the metal will be exactly straight after the tacking is complete. If the joint is to be brazed, it is that much more important that the lapped-over metal be supported, since otherwise it will buckle inward under the heat applied. The method of overlap shown is deemed the best (see upper left hand corner, Fig. 1), because if we bring the overlap down inside in a corner, with the duct side coming up to the top and covering it, we should have trouble keeping this side straight under flame unless an angle iron or similar piece were clamped tightly against the lap. In both cases, whether the method is that of (A), or that of (B), as per the drawings, a holddown jig or fixture will prove much better than separate pieces of angle or channel precariously secured to the metal, by long clamps across the duct.

Construction Details

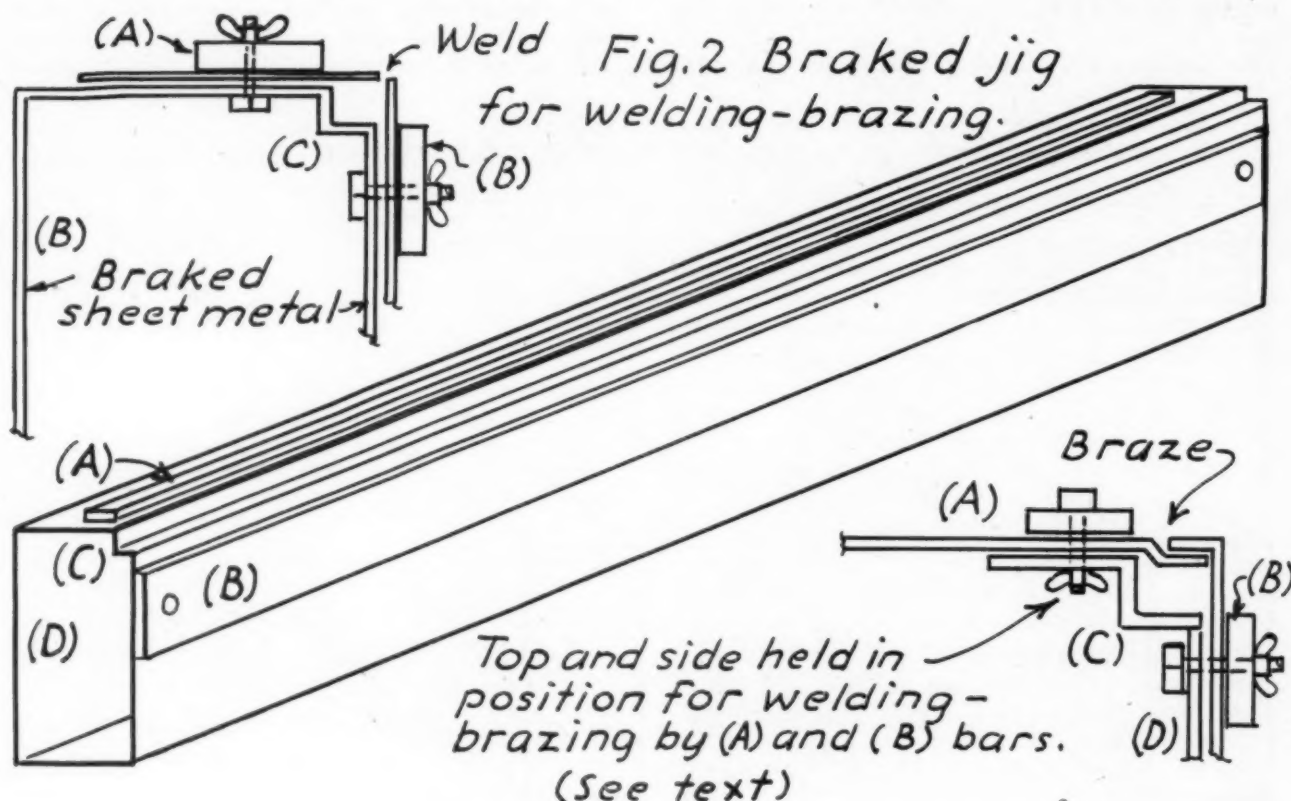
Fig. 2, of the drawings shows a braked construction of the jig, the metal used for it being 18 or 16 gauge, joined by tack-welds in the inverted corner (C). This jig is about six inches longer than the section of duct; and in the three inch margin on each end are holes for bolts, (fastened by wingnuts) which tighten bars (A) and (B) against the metal of the jig thus clamping the metal of the duct to be brazed as shown in the lower right hand corner of the drawings in Fig. 2. The duct to be welded is similarly clamped for work as shown in the upper left hand corner of Fig. 2. The inverted angle (C) shown in both applications, is only about one inch deep and one inch wide, just enough to provide an open space under the lap to be brazed, or the duct edges to be welded. This space is a necessary condition in both cases in order to keep the heat applied from being quickly lost. With the open space (C)

provided, the torch heat will remain in the metal where it is wanted. At the same time (A) and (B) will hold the respective duct sides in their braked condition, straight, preventing the heat of the torch from bending the metal or buckling it.

Although the drawings show solid steel bars used for clamping purposes, a 2 by 4 by $\frac{1}{4}$ in. channel having a smooth working surface, will prove lighter and easier to handle and still perform the same service a solid bar would. In the drawings, (D)—(D) relates to the metal of the braked fixture. It is not necessary to fit the fixture inside of the duct, as the one shown in Fig. 2, would indicate. With the bolting arrangements at (A) and (B), one at each end, the fixture might not be more than shown in the lower right hand detail. In this case the metal would be braked of one piece, with the step (C) braked into it. This fixture could be used for practically any other rectangular job, no matter what the dimensions might be. Certainly, with only this fraction of the fixture to employ, we would spend more time and require help to hold the metal in position at the other end. But if the fixture is small enough to slide inside the duct, one man can handle the clamping job.

Quantity Determining Factor

All of these considerations are based upon the quantity of pieces to be produced. If one and the same rectangular duct is to be made in, perhaps, fifty sections; or at least ten sections on frequent repeat orders, then it would pay to have a fixture made to the specific size of the product, with the fixture fitting snugly into the section. The time saved by the welder in using the full size fixture, and using part of the fixture for many other sizes of ducts, would soon compensate for its cost. Any time saved thereafter would be clear profit.



However, if we have many sizes of rectangular pieces, without any one size wanted in more than a few sections, sound economics would decide in favor of the fractional all-purpose jig, made of one piece of 11 or 12 gauge sheet, to insure the angle "C" remaining in shape.

Brazing Techniques

Progressing to the brazing-welding work itself, we see in Fig. 3, 4, 5 and 6, certain methods of the work. Needless to say, we cannot do a standard brazing job without a lap. Brazing is much like soldering. The flame does not melt and fuse the metal edges, as welding does. The flame simply heats up the metal at the juncture of the two metals, to a degree sufficient to melt the brazing rod which is brought in contact with the piece. The rod is "fluxed" from time to time, flux making the rod-metal flow. The flux also cleans impurities from the metal to be brazed, and curtails scaling. The fluxed rod should not contact the flame. It should remain about three quarters of an inch away contacting only the metal heated cherry red. The flame moves along, heating the two joining metals to a point at which they will melt the rod on contact, but it is never used to melt the rod directly. The heated metal will eagerly absorb the metal of the rod, just as if it were solder. Fig. 3 illustrates the respective positions of the flame-point in relation to the rod-point, which follows in its wake, as indicated also in Fig. 5. Brazing rod (fluxed properly), is held above the metal until the color of the metal under heat starts glowing; at this instant the flame moves along, distributing the glow of the metal along the seam, while the rod descends to the metal and melts into the overlap. If the rod does not melt, the torch must return to the spot and heat it again; but the proper method is to heat a small area, possibly one inch in length, and progress slowly along, with the rod closely behind.

Welding Methods

In Fig. 4 is shown the position of the flame-point upon the metal to be welded. Welding means fusing, and the metal must dissolve under the heat, the sharp edges dissolving first, then the whole width of the edge showing signs of melting. The welding rod is held in the opposite direction from the flame, as shown in the drawings, and although the point of the rod is in contact with the flame, the flame itself should not melt the rod; its contact with the dissolving metal should do so. The rod is used for filling the gap between the two metals welded, but this filling must be done after the fusing metal will melt the rod. In Fig. 6 is shown the so-called "drip-welding", where the rod near the flame will be heated up enough to be in melting condition, and the fusing metal under the rod will attract the rod to drip, the drips filling in the gap. Whatever flux is used, the rod can be used to flux the weld metal during the welding process because on a non-fusing metal the flux will form a scale which prevents heat from penetrating to the metal. If applied at the right time, the flux will become clear, almost like molten glass, disappearing into the pores of the glowing metal. Fusing metal is not burning it. In fact, when "sparks"

Fig.3 Proper brazing method
(see text)

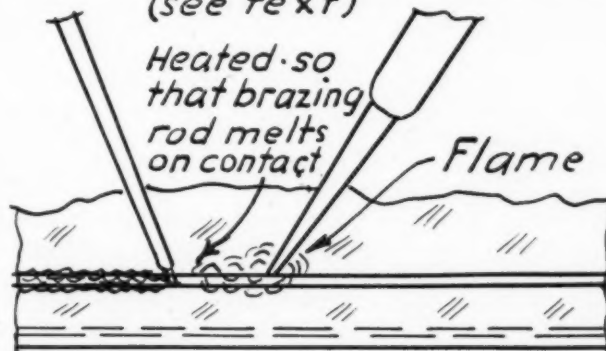


Fig.4 Welding method
(See text)

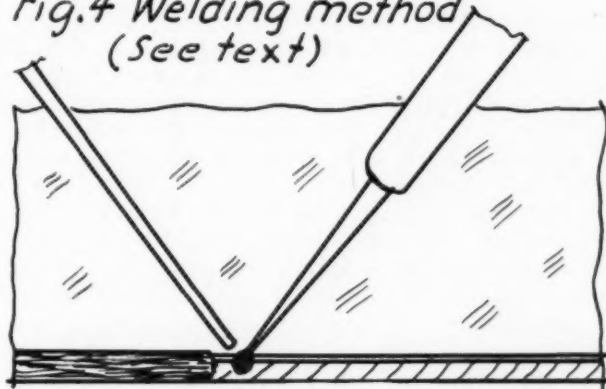


Fig.5. (See text)

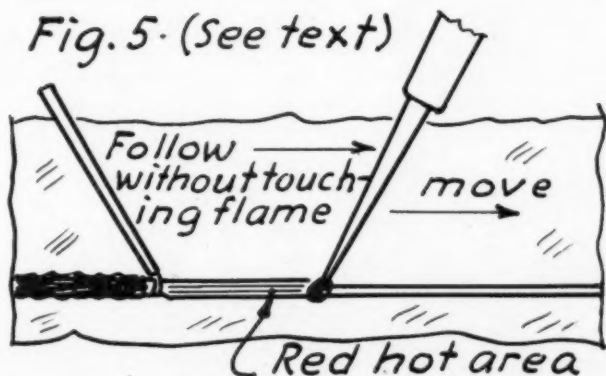
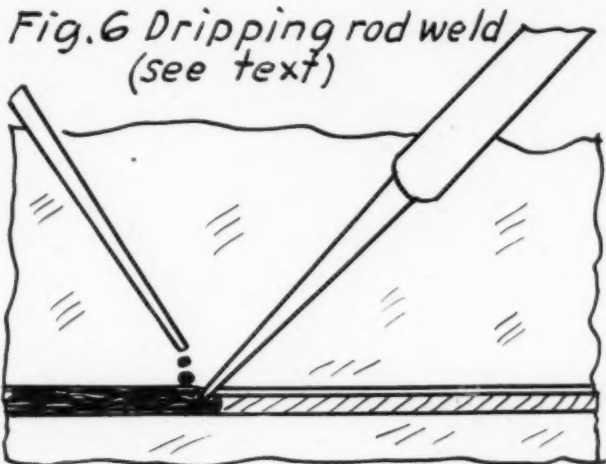


Fig.6 Dripping rod weld
(see text)



shoot up under the flame, the metal is burning, and the flame should be removed quickly. Once burned, the metal will not fuse.

In any welding, the two metals to be joined by fusion should be aligned to form a groove for the welding rod to fill. The object of this groove is to present as large an area for the fusion as possible. This is illustrated in Fig. 7, which shows a groove in the two pieces of metal coming together. Were welding done on top of the juncture of the two sheets (with no groove provided) there would be no fusing of the metal and the rod would be unable to form a bond. Where the sheets join laterally, as in Fig. 7, a 45 degree corner is ground off each sheet, producing a groove deep enough between the two metals to allow application of the flame and reduction of the edges which are butted together, forming a bond. The welding rod itself does not bind securely, and should not be used in the groove until the metal of the sheets has started to liquefy, when the rod will fuse with it. Where welding is done on metal forming a corner, as the lower (B) in Group 1 illustrates, the weld-groove is formed by meeting of the sheets and the gap can be increased in thinner metals allowing one sheet to cover only a fraction of the edge of the other sheet.

In flat sheet welding or brazing, as in Fig. 7 and 8, supports (A)—(A) and (B)—(B) can be used; the (B) supports can be channels, and if the (A) pieces are used clamped to (B) at the ends, with the sheets between the two clamps, their thickness need not exceed $\frac{1}{2}$ inch; or, a $\frac{1}{4}$ inch thick sheet can be formed to the desired angle shown, with the base portion used for clamping to (B). The cut-off corner in the blocks

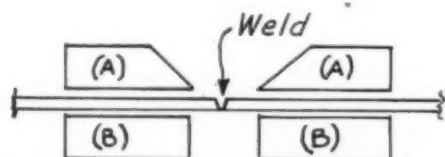


Fig. 7 Flat sheet welding

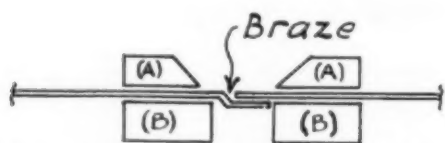


Fig. 8 Flat sheet brazing.

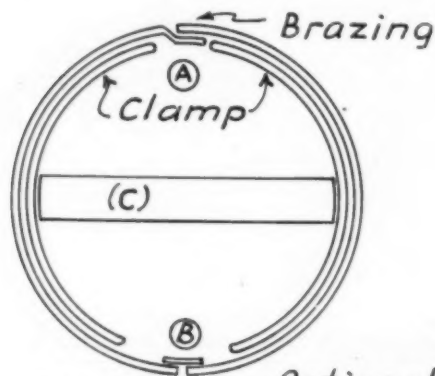


Fig. 10 Optional brazing

(A) indicates that the flame is applied on about the degree of the cutoff, not from a vertical position. This is so because the flame must play on the portion of the metal forming the groove, unless the metal is very thin, in which case, however, the flame is applied on the said degree because if it were pointed straight down upon the heated sheet, the force of the flame might bend the sheet. That same precaution should be observed in respect to brazing the light metal under conditions shown in Fig. 8. In this operation the flame is directed from the side of the seam, or joint, along which it moves. A vertical flame has the added disadvantage of spreading over the metal and obstructing the operator's view.

Fig. 9 shows a tube joined in its butting edges, grooved as above specified. The tube is held in a channel, which might be sheet metal braked for the purpose, of metal heavy enough to hold the shape. In Fig. 10 we see a thin metal tube brazed by an offset lap, shown on top in the figure. The optional provision (B) is not recommended, because it is difficult to hold the strip of metal, providing the lap, in its place and keep it from buckling under heat. If a large quantity of the tubes of that same size are to be made, it would pay to construct the fixture (A), of heavier sheet metal, rounded to the desired radius, and joined by (C) as shown. Then two small clamps can be used to hold the tube-ends tight to the metal of the fixture. In brazing thin sheet metal it should be remembered that the metal must be heated almost to a cherry red to melt the rod. It should be held in such a position as to be pre-heated by the flame, but it should melt only when contacting the metal itself.

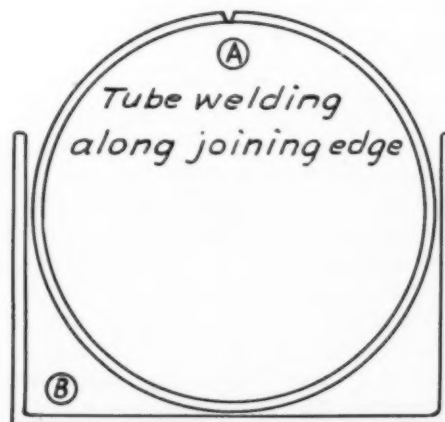



Fig. 9



A Roof of "PRE-TESTED" QUALITY

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Of all the commonly used sheet metals, copper is the most enduring when exposed to the elements. But experience has shown that while *correct* installation details insure permanence and trouble-free service . . . *incorrect* details can cause unnecessary failures.

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Revere materials are available from leading distributors throughout the United States. A Revere Technical Advisor, Architectural, will always be glad to consult with you, without obligation.

*"Copper and Common Sense."

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Mills: Baltimore, Md.; Chicago, Ill.; Detroit, Mich.; New Bedford, Mass.; Rome, N. Y. — Sales Offices in Principal Cities, Distributors Everywhere.

St. Agnes Church, New York

A. Munder & Son, Inc., roofing contractor

Thomas A. Kelly, Consultant

Why you and your advertising manager are partners

FROM WHERE YOU SIT, advertising may look like the "glamour department" of your company—necessary, of course, but pretty far removed from the hard-headed realities of the production line.

But take a closer look. In one respect, the advertising manager's job bears a striking resemblance to your own.

You're production-minded. You're concerned with anything that will improve plant procedures, speed up assembly time, prevent waste, and reduce the manufacturing cost per unit.

And that is precisely where you walk arm-in-arm with your advertising manager. Because he thinks the same way about the *manufacture of a sale*.

The whole process of selling and distribution are his assembly line. And every time he can reduce the unit cost of a sale by so much as a few cents, he increases your company's chance to show a profit.

Ask him for a definition of advertising, and he will probably tell you that it is simply *mechanized selling*, a machine that multiplies the productive capacity of the sales force—seeking out prospects, arousing their interest, creating a preference for the things your company makes.

And when it is concentrated among the hand-picked readers of business papers, advertising becomes the most efficient machine this partner of yours has found for lowering the cost of producing a sale.

What are the ten ways to measure the results of your business paper advertising? You'll find the answers in a recent ABP folder, which we'll be glad to send you on request. Also, if you'd like reprints of this advertisement (or the entire series) to show to others in your organization, you may have them for the asking.

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ASSOCIATION ACTIVITIES



Carolinas

THE Carolinas Roofing & Sheet Metal Contractors' Association welcomes two new members into their group. They are: the R. S. Garmon Roofing Co., Charlotte—Roy S. Garmon, owner; and the Hickory Sheet Metal Co., Hickory, N. C.—Lee J. M. Huffman, owner.

The A. I. A. joint committee on contractor and architect relations met on January 13 at Chapel Hill. This committee is composed of architects, contractors and sub-contractors and the committee goes over different matters and presents those they consider worth while to the Association of Architects.

W. P. Baker, a director, has been asked to jot down the normal procedure in holding a local association meeting and he has provided some very good suggestions published in the March issue of the association bulletin.

The association invites contractors who are air conditioning cotton mills and sheet metal shops that do textile work in the Carolinas to seek membership.—*J. A. Piper, Editor.*

Fox Valley, Illinois

AT THE annual meeting of the Fox Valley Sheet Metal Contractors' Association, Bill Klinkey and Bill Stevens of the Apprentice Training Committee gave a complete report on the activities of the school. These suggestions were offered:

1. That a detailed record of all the school sessions be kept by the Committee.
2. That the president of the Association, Jack Stowell, set up a schedule for the members of the association who are on the training committee, for visiting the sessions of the school.
3. That the various contractors talk with their students and explain to them the desirability of continuing with the school, to obtain all the information they can which will enable them to become competent journeymen.
4. The members want to know who can attend the civilian school. Does the man have to work in an approved shop?
5. That the secretary find out if the \$45.00 paid for supplies can be repaid by the government.

The following were elected as officers for the ensuing year:

President	Jack Stowell
1st V-President	Fred. Lamp
2nd V-President	Fred Nolting
Secretary	Bill Stevens
Treasurer	Clayton Evelien
Sergeant-at-Arms	Henry Heffelfinger
Directors: George Bushman	J. W. McAllister
George Lehnert	Andrew Lind
Art Ninke	Bill Klinkey

President Jack Stowell predicted that the association will be featured in the national trade press as having started the first really successful training school in the United States. He appointed the present Training Committee (Bill Stevens, Bill Klinkey, Fred Lamp, Joe Strotz and Mervin Lohbauer) to carry on, and asked that they be given power to act for the association in matters pertaining to the training school.

Members of the Apprentice Training Committee stated that the school was desperately in need of tools and equipment for their shop in St. Charles. Contractors present pledged \$225, of which \$95 was paid in cash for the purchase of the equipment and tools, provided that Local 220 matches this money, dollar for dollar. It was voted that the school training committee be empowered to be trustee of the money collected and tools purchased.

Four guests from the Republic Metals Company, Chicago, were present: Ray D. Strom, Bill Silbeman, Vern Joy, Sr., Walter J. Joy, Jr.

Buck Joy, Jr., spoke at length on "What's Ahead for the Sheet Metal Industry." He mentioned the fact that in the thirties there were no dollars, but plenty of steel. Now when the world is starved for steel there are plenty of dollars but a short supply of steel. The drop in commodity prices has had the effect of making people more cautious. Tightening up of credits may have the effect of removing part of the gray market and may free some steel. He predicted maximum output and a price decline of perhaps 20 per cent. A drop in the raw material prices will not affect retail prices very much. Speculators will be hurt, not the first-class shops, mechanics or manufacturers. Ours is not a luxury industry—it is a necessity. He recommended that we do more selling and pay more attention to credits, keep the inventory as low as possible, plan on reduced profits, step up methods of fabrication, reduce overhead, and watch capital expenditures.

Three new members were voted in on this night.—*William B. Stevens, Secretary*

Michigan

Saginaw Valley

Saginaw Valley has a new slate of officers:

President	Bennett MacArthur
Vice President	Don Snyder
Secretary-Treasurer	Al Klop

Grand Rapids

Grand Rapids meets the first Tuesday of each month, with election of officers in January. At the January, 1948, meeting, the following new officers were elected to serve for the coming year:

President	L. A. (Cal) Calaterra
Vice President	Bill Honecker
Secretary	John Holwerda
Treasurer	E. J. Wasel

The Michigan Convention

ANOTHER state convention easily passed the three hundred mark in registrations when the Michigan Sheet Metal, Roofing, Heating and Air Conditioning Contractors Association held its thirty-seventh annual meeting in the Fort Shelby Hotel, Detroit, March 4th to 6th. A new permanent secretary, Jim Neall, has taken over direction of the activities of the Association since last year's convention in Bay City and all indications are that this organization is really on the upgrade. Indicative of the general attitude is a statement by Thomas W. Clark, Detroit, newly elected president of the Association, as printed in the official program, "I think we are all pretty much agreed that never before has the need for association—local, state and national—been so important to our industry. But simply recognizing the need is not sufficient. *We must act.* It behooves each and every one of us to give serious consideration to ways and means of preserving the associations we already have and working for their improvement and extension."

Proceedings

Thursday, March 4th, had a meeting of the board of directors of the Association as the major item of business and in the evening a group of convention attendees went on a sightseeing tour that included one of Detroit's more well-known night spots. Registration was in order on Friday morning and the convention proper was called to order in the afternoon. President E. L. Ackerman acted as chairman of the meeting and introduced the mayor to greet the delegates on behalf of the Motor City. After the greetings had been completed, J. D. Wilder, executive secretary of the Sheet Metal Contractors National Association took over the meeting to present the "National Hour."

P. W. Olmen, Chicago, addressed the group on the

subject of Trade Relations and emphasized the need for keeping an eye to the future when business is not quite as easy to obtain as it is at present. One major means of enlarging the scope of business that he specified is the investigation of jurisdictional awards of work that many contractors may or may not be doing. If awards have been made and the sheet metal contractors are reluctant to do the type of work awarded it is quite probable that the force of the award will be lost. If a man wants a job done and you won't do it someone else will and when times are tighter work passed up in that fashion might mean the difference between profit and loss.

Dee Cramer of Detroit spoke on Bookkeeping, going back thru the history of the Bookkeeping Committee and discussing its progress in determining the exact need, in the way of a bookkeeping system and the trouble they experienced in marketing the system. As it turned out they located a very satisfactory system that was altered only slightly to fit the needs of the heating and sheet metal contractor and have made it available thru the national office of the SMCNA in Elgin, Illinois.

Jay Biddle, Detroit, was assigned the subject of Apprentice Training and never being one to tell people things they already knew immediately transported the audience back to the 15th century to discuss the origin of the modern-day apprentice. Dealing with the craft guilds he brought his hearers forward to 1659, the date that the first apprentice was indentured in this country and then wandered on into 1918 when the Smith-Hughes Act set up a federally recognized, organized apprentice program. The year 1937 was another milestone in the progress of apprentice training since that was when the Apprentice Training Service of the federal government was set



Conversing is a favorite pastime.



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A case of grin and bear it.
Roy Harrison is happy, as usual.



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up. Mr. Biddle then went on into the matter of numbers of apprentices, showing that there are not enough now, even after a great increase in the last two years. The part of the journeyman in public relations was stressed and the point brought out that the apprentice of today is the journeyman of tomorrow—"as the twig is bent."

Walter Keist, Pittsburgh, was unable to attend and deliver his talk on Warm Air Heating so Mr. Wilder gave some of the highlights of his speech. Mr. Keist had listed three subjects that he recommended action upon by the warm air heating contractor: workmen's compensation rates, which have been too high; lawsuits resulting from accidents to work which may have been completed years ago, he advised product liability insurance; an apprentice training program for warm air contractors running open shops (AA, March, '48, Page 78).

Harold Murray, Chicago, took up the important matter of Labor Relations and brought the convention up to date on the activities of the Labor Relations Committee of the national association. He dwelt at some length on the importance of labor relations and emphasized the point that labor is the largest cost item an employer has and yet many employers are completely indifferent to good labor relations. He told of the new type of standard agreement being developed by the SMCNA and also of the new labor

"pool" system that has been set up to circumvent the closed shop prohibition of the Labor Management Relations Act. A new plan for handling jurisdictional disputes was also discussed.

The convention banquet was held Friday evening and followed by an excellent program of entertainment.

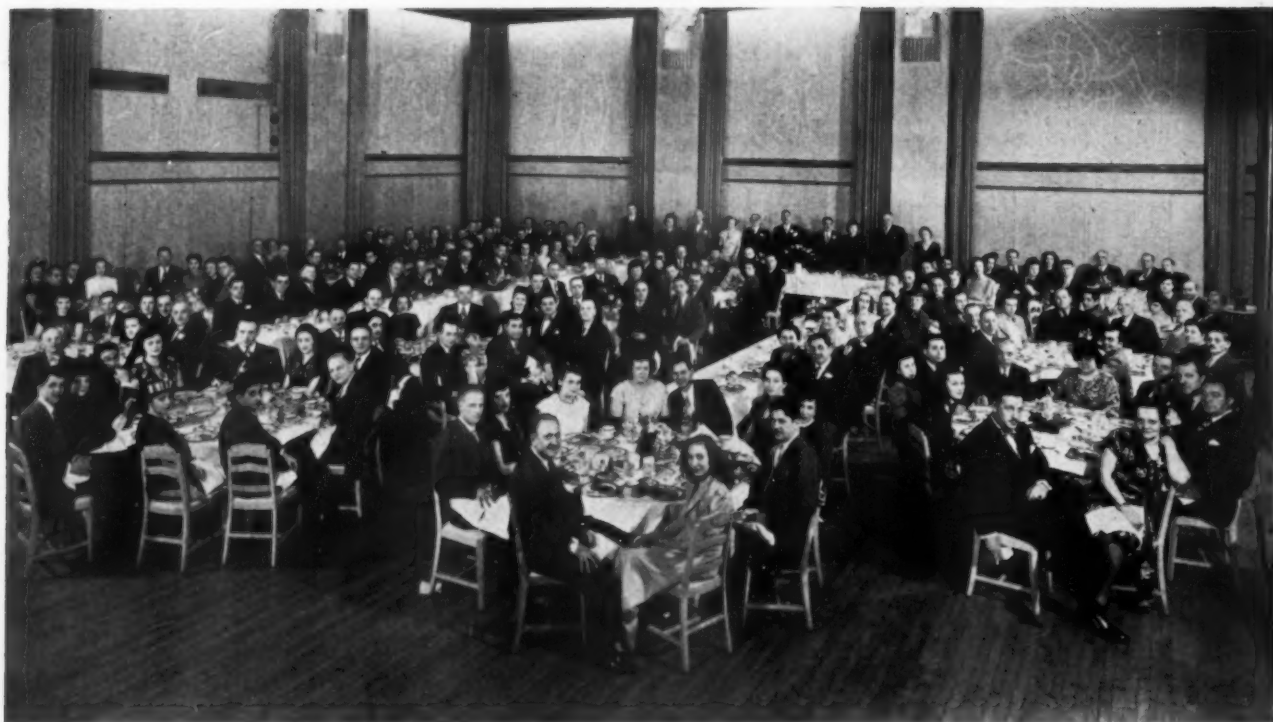
Saturday morning, March 6th, was devoted to reports of officers and committees and election of officers for the coming year. Luncheon meetings were held of the Heating division and the Roofing and Sheet Metal division. Saturday afternoon saw the annual meeting of the Traveling Salesmen's Auxiliary and the evening was devoted to a banquet and entertainment sponsored by the "peddlers" as Fred Bishop insisted on calling them.

Officers

T. W. Clark.....	President, Detroit
Dee Cramer.....	Vice President, Flint
Elmer Stafford.....	Treasurer, Flint
James Neall.....	Executive Secretary, Detroit

New Directors

John DeHaan.....	Kalamazoo
Bennett MacArthur.....	Saginaw
George LuBahn.....	Jackson
M. H. Vanassche.....	Detroit



Warm Air Furnace League of Cleveland

The Annual Convention of a group that is actively engaged in the furnace replacement market.

AT THE annual meeting of the Warm Air Furnace & Air Conditioning League, Don Fisher was elected president for the ensuing year. Other officers elected are:

William Kaiser.....Vice President
Michael Orbella.....2nd Vice President
John Nugent.....Secretary
William Donnelly.....Treasurer

William Powell of the William Powell Furnace Company, 16354 Euclid Avenue, was elected to the Board of Trustees; and Elsworth Hann of the W. F. Hann & Son Co., 15505 Euclid Avenue was appointed Chairman of the Electric Codes Committee.

Mr. Fisher succeeds Robert Thompson of the Thompson Sheet Metal & Furnace Co., 1472 Hayden Avenue.

The league was formerly started in 1933 to cope with the N. R. A. and has carried on through the years. The objective of the association is to promote warm air heating and air conditioning in private dwellings. It sponsors schools for members who are greater Cleveland's progressive heating contractors, so that they, in turn, may install better heating systems in homes. During the past year the greatest activity of the association has been caused by the shortage of gas in this area, which to date caused no great hardship. They have apprentice boys going to school at the Eagle Avenue Trade School to learn the fundamentals of installing heating systems properly.

The projects for the year 1948 shall be:

1. To continue the education of its members.
2. To promote better heating for homes.
3. The testing of aluminum as a substitute material for galvanized iron.
4. Continue apprenticeship classes at the Eagle Avenue Trade School.
5. The rewriting of the City Code pertaining to domestic heating.
6. To educate the public of the simple fundamentals of the proper operation of furnaces. For this they offer the following suggestions:
 - (a) Keep the thermostat at 70°.
 - (b) Close off unheated rooms.
 - (c) Draw the shades when the temperature declines.
 - (d) Do not use kitchen stove or oven for heating, as this will use more gas than the furnace and is dangerous.
 - (e) Clean the filters of the furnace regularly.
 - (f) When burning coal do not open the draft of the furnace for a long period of time, as when the draft is open the heat goes out the chimney and fuel is wasted unnecessarily.
 - (g) Keep the check open most of the time.

These few rules quoted will not only save fuel but money too.

Sheet Metal Contractors' National

THE 1948 annual convention of the Sheet Metal Contractors National Association will be held May 3, 4 and 5 in the Hotel Cleveland, Cleveland, Ohio.

The convention will be two and one half days in length with registration in the morning on Monday, a full day of sessions on Tuesday and a one-half day session on Wednesday. Following is an outline of the program:

Monday, May 3, 1948

- 9:00 AM—Registration on mezzanine floor
- 11:00 AM—Opening of convention—Ballroom
Address of the President, R. E. Walsh
- 12:00 AM—No official luncheon
- 1:30 PM—Report of National Treasurer—Ballroom
- 2:00 PM—Report of Executive Secretary—Ballroom
- 2:30 PM—Address on General Business Subject—Ballroom
- 3:00 PM—Reports of standing committees on past year's work—excepting Labor Relations Committee
- 5:30 PM—"Get-together" party in Red Room
- Evening—No official function—guests can "see" Cleveland

Tuesday, May 4, 1948

- 9:00 AM—Red Room—Report of Nominating Committee
- Red Room—Report of Labor Relations Committee
- Red Room—Labor Relations "Forum"
- 12:00 AM—Ballroom—Luncheon with speaker on sheet situation and prospects
- 2:00 PM—Red Room—Warm Air Heating "Forum"
- 2:00 PM—Empire Room—Sheet Metal "Forum" (including contracting, ventilating, manufacturing, etc.)
- 2:00 PM—Rose Room—Roofing "Forum"
- 7:00 PM—Ballroom—Banquet (entertainment only)

Wednesday, May 5, 1948

- 9:30 AM—Red Room—Reports of "Forum" chairmen with suggestions for association activities in coming year
- 10:30 AM—Red Room—Vote on amendments to by-laws
- 11:00 AM—Red Room—Election of officers
- 11:30 AM—Red Room—Address by Robert Byron, President, Sheet Metal Workers International Ass'n
- 12:30 PM—Ballroom—Official luncheon with presentation of incoming officers and directors
- Afternoon—In announced rooms—Board of Directors meeting
Committee meetings

The Forums

A feature of all past national conventions has been the "forums" to which all contractors, whether mem-

bers or not, are invited. Each forum is conducted by one of the national committee chairmen who reports on work done during the past year and accepts suggestions from the audience for activities in coming months.

This year the Labor Relations forum will be held apart from the other forums so that all employers can attend. The Warm Air Heating, Roofing, Sheet Metal forums will be held simultaneously on Tuesday afternoon.

With the Taft-Hartley law abrogating all past labor relations, this year's convention will be (1) a short course for employers explaining employers' new rights under the law; (2) a report on the past year's work in developing a new Standard Form of Agreement; (3) a report and explanation of the significance of the new agreement; (4) a complete discussion on the features of the law and agreement as the Labor Relations committee understands the law; (5) an explanation of the steps to be followed to comply with all the requirements of the T-H law (including an analysis of the things labor must do to comply); (6) an explanation of the procedure to be followed to comply with NLRB rulings for "elections," petitions, complaints, etc.

The Warm Air Heating Forum will present a report and accept discussion on several of its long range activities—(1) insurance coverage for automatic-fired heating equipment; (2) too-high compensation rates for heating work; (3) apprentice training for heating installers and service men; (4) the problem of one union to cover men doing furnace installing, electrical, work, refractory work, plumbing on furnaces.

The Sheet Metal Forum plans to discuss as widely as possible the present and future sheet situation—to present facts obtained from a sheet use survey to be ready for report by May 1. This forum will also discuss "Jurisdictional protection" and the effect of the Taft-Hartley law on jurisdictions. The matter of up-to-date codes for ventilating and air conditioning will be opened for discussion.

General Business Reports

Tentative acceptances have been received from one speaker who has had a large part in conducting the Senate's investigation into the steel and sheet situation.

From either the national association's attorney or from a qualified authority on the Taft-Hartley law, there will be one and perhaps two speakers to explain how the law operates and answer questions on procedure. The problem of establishing jurisdictional rights so that our industry may continue to claim and do work previously awarded to our craft will be a part of this speaker's report.

Entertainment

The convention officers especially urge members and guest contractors to bring their wives. Cleveland offers a wide choice of entertainment.

Business

This year's convention will undertake the passage of far-reaching business of the association. Important changes in the constitution and by-laws will be voted upon. Members will be given an opportunity to voice their suggestions and recommendations for future association activity.—J. D. Wilder, Executive Secretary.

Los Angeles

RICHARD O. MONTRIEF, president of the Institute of Gas Heating Industries, calls attention to the fact that gas fuel used in residential heating remains as one of the few necessities whose cost has stayed down. "As a matter of fact, the cost of gas is even lower today than in 1939."

The February meeting of the Institute of Gas Heating Industries was held at the Nikabob Restaurant with 96 in attendance. Harry Allen of the Department of Heating & Ventilating of the City of Los Angeles, and John Droge of the Holly Manufacturing Company at Pasadena were guests.

The door prize—a new Warco dual-wall furnace donated by Ward Heater Co.—was won by A. H. Basten of Truman Home Appliances.

Vice-President Banowsky introduced two new members—Arthur E. Meyer of Meyer Sheet Metal Machinery Co., and J. H. Lewis of Grayson Controls.

Mr. Banowsky, chairman of the Ordinance Committee, talked on the work done by the Heating Code Advisory Committee and touched on the accomplishments of the Institute in receiving recognition from the City of Los Angeles.

Managing Director Kimmel reported on the work done through his office, saying that framed copies of the Code of Ethics were available.

President Montrief presented Glenn Ashburn as Chairman of the Evening, who in turn introduced Speaker H. Dean Campbell on the subject "Know Your Costs." Mr. Campbell has had some 22 years experience as a professor and is well qualified as a CPA.

President Montrief presented the Chairmen and members of the Standing Committees for the year 1948. They are as follows:

MEMBERSHIP: Chairman J. Caden Jenkins; Henry B. May, Robert Laabs.

ORDINANCE: Chairman A. B. Banowsky; R. T. Bridges, Tom Pinatelli, A. B. Wicks, Oscar Simmons, Robert Stanley.

ADVERTISING & PUBLICITY: Chairman Sam Jaffe; Mickey O'Haver, E. A. Guenther.

ENTERTAINMENT: Chairman Johnny Evans; Don Bentley, Pat Christensen.

PROGRAM: Chairman Glenn A. Ashburn; Floyd S. Parmenter, Gene Grau.

EDUCATIONAL: (Short) Chairman Fred W. Heisinger; Don S. Kirtley, S. A. Carl, Karl Keeler, Sr.; (Long) Chairman Art Theobald; F. O. Suffron, J. A. Reade, R. C. Terradell.

ATTENDANCE & RECEPTION: Chairman Frank Daniels; Clinton F. Harte, Art Enderle.

GRIEVANCE: Chairman Joe Wilson; I. H. Quinn, James A. Craige, W. O. Wylie, Glenn A. Ashburn, Ed Johnston.

BUDGET: Chairman Walter R. Dicus; Harry Haldeman, John P. Vein, R. B. Sutphen.

RULES & BY-LAWS: Chairman Leo Hungerford; J. Caden Jenkins, Oscar Simmons.

EXAMINATION: Chairman Glenn A. Ashburn; John P. Vein, E. B. Magness, Carl P. Kriwanek.

SERGEANT-AT-ARMS: Olaf A. Lundberg.

E. W. Kimmell, Man. Dir.

St. Joseph Valley, Indiana

THE March meeting of the St. Joseph Valley Furnace & Sheet Metal Contractors, Inc., was held at their headquarters, 117 East Madison Street, South Bend, Indiana.

President J. R. Walker explained in full the new Indiana heating code. He reminded members it is important to keep records of Federal income tax, payroll records, union agreements, etc., for a period of four years from date of entry.

New members welcomed and received were Mr. Casey of Elkhart and Mr. Tromboni of Mishawaka.

The members appreciate the refreshments provided by James Claxton of the South Bend Supply Company. —*William R. Tesky.*

COMING EVENTS

May 3-5—Sheet Metal Contractors' National Association, Inc., 1948 Annual. Hotel Cleveland, Cleveland, Ohio. J. D. Wilder, Executive Secy., 170 Division St., Elgin, Ill.

May 18-21—National District Heating Association, 39th Annual. Hotel Statler, St. Louis, Mo.

May 24-25—National Association of Sheet Metal Distributors, Spring Meeting. Deshler-Wallick Hotel, Columbus, Ohio. Thomas A. Fernley, Jr., Exec. Secy., 505 Arch St., Philadelphia 6, Pa.

May 31-June 2—American Society of Refrigerating Engineers, 40 W. 40th St., New York 18, N. Y. 35th Spring Meeting. New Ocean House, Swampscott, Mass.

June 7-10—Oil Heat Institute of New England. New England's Biennial Exposition of Oil Heat. Hotel Statler, Boston. Fred N. Beckwith, Executive Secretary, 839 Beacon St., Boston.

June 10-20—Third Annual Home and Building Exposition. Presented by 14 construction industry associations of Southern California and the Los Angeles Chamber of Commerce. Pan-Pacific Auditorium, Los Angeles. Earl S. Anderson, Exec. Vice-Pres., Suite 713, Ninth and Hill Bldg., 315 W. 9th St., Los Angeles 15.

June 11-12—Carolinas Roofing & Sheet Metal Contractors' Assn. Annual Convention. Myrtle Beach. J. A. Piper, Box 599, Greenville, S. C.

INDOOR COMFORT CONFERENCES

Green Bay, April 14, 15, 16—J. C. Berger, Metal Service Co., 100 Stuart St., Green Bay, Wis. Minneapolis, April 21, 22, 23—Stuart A. Smith, Waterman-Waterbury Co., 1121 Jackson St., N.E., Minneapolis 13, Minn.

Des Moines, April 28, 29, 30—John C. Rehmann, Keith Furnace Co., Dean Ave. at East 26th, Des Moines, Iowa.

Denver, May 5, 6, 7—J. H. Singleton, C. A. Crosta, Inc., 1830 Market St., Denver 2, Colorado

CANADA

Amherst, N. S., April 26, 27, 28 and 29—F. R. Rand, Sackville, N. B. Local Chairman.

EQUIPMENT DEVELOPMENTS

Stainless Eaves Trough...73

Stainless steel eaves trough, conductor pipe, Style "K" box gutter, elbows, hangers, mitres, ends, outlets, etc., are in production.

The stainless steel footage material is fabricated from strip, thickness of .015, and can be soldered with a special flux.

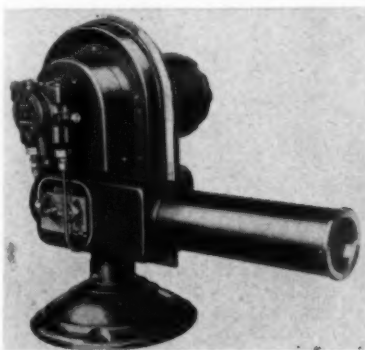
Berger Manufacturing Division, Republic Steel Corporation, Canton 5, Ohio.

Gun-Type Burner...74

An automatic, gun-type oil burner, designed to burn any standard grade of straight-run or catalytic stock fuel oil is being introduced.

Complete control is maintained over amounts of fuel oil, and primary and secondary air introduced into the combustion chamber. The oil and each air inlet has its own individual control, and simple dial settings permit maintenance of fuel-air balance.

An oversized blower increases pressure and turbulence within the



combustion chamber, causing a high percentage of fuel utilization. Direction vanes around the interior surface of the combustion cone result in a whirling flame and a greater combustion potential.

Nozzle is interchangeable to produce flame suited to shape and size of combustion chamber of furnace. Other features are high-tension electronic "spark ignition;" heat-resistant alloy steel inner cone; rotary-type oil pump operating in permanent oil bath; and fully-automatic thermostatic controls.

Norge-Heat Division, Borg-Warner Corporation, 574 East Woodbridge St., Detroit 26, Mich.

Use the Coupon on this page

Electric Home Heaters...75

Nine new electric home heaters for national distribution have been announced. Eight of them are 240-volt units, the other a 120-volt model. With one 120-volt, 1250-watt portable heater in production for the past year, the new units bring the full line of electric heaters to



a total of ten, all approved by Underwriters' Laboratories, Inc.

New units announced include:

Three 240-volt floor models with built-in "Adjust-o-matic" thermostat control, ranging in size from 2000 to 4000 watts.

Five 240-volt wall models incorporating the same automatic control, ranging in size from 1500 to 4000 watts.

One 120-volt wall model, 1250 watts in size, designated as the Westinghouse Bathroom Electric Heater.

Such heaters may be used for auxiliary heating anywhere suitable current is available.—Westinghouse Electric Corporation, P. O. Box 1017, Pittsburgh 30.

Building Corners...76

Building corners made from aluminum will soon be available. The line was formerly made of galvanized steel.

This rust-proof metal is practically unaffected by the weather.

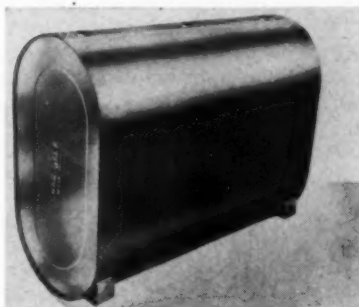
The aluminum building corners are being made for all standard sizes of lap siding as well as 6 in. drop siding.

Klauer Manufacturing Company, 9th & Washington Sts., Dubuque, Iowa.



Aluminum Tanks...77

Lifetime aluminum tanks—102 ga. with standard openings and brackets for legs—are available for



storage of fuel with a capacity of 265 gallons.

Char-Gale Manufacturing Co., 4325 Hiawatha Ave., Minneapolis 6, Minn.

MAIL THIS NOW!

We will ask the manufacturers to send full particulars about the products and literature mentioned.

Be sure to circle the items you want.

Equipment Developments

73	74	75	76	77	78	79	80	81	82	83
84	85	86	87	88	89	90	91	92	93	94
95	96	97	98	99	100	101	102			

New Literature

234	235	236	237	238	239	240	241
242	243	244					

Manufacturer ☐ Jobber ☐ Dealer ☐

Name

Company

Address

Address: AMERICAN ARTISAN, 6 North Michigan Ave., Chicago 2, Illinois

EQUIPMENT DEVELOPMENTS

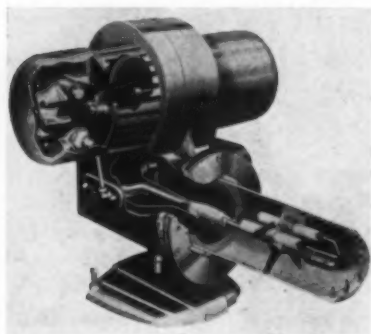
Use the Coupon on Page 121

Oil Burner.....78

Model C-7 is a completely redesigned oil-fired conversion burner for small homes with a firing capacity of from 1.00 to 2.25 gph for a rating of 100,000 Btu per hour minimum to a maximum of 225,000 Btu per hour.

This gun-type, pressure atomizing conversion oil burner features an aluminum casting made by permanent mold process. The construction arrangement is such that the motor, pump and fan are mounted above the air tube center line.

Model C-7 contains the IRIS Shutter feature—an adjustable or variable orifice—mounted on the discharge side of the fan, which meters the primary air for combustion. Deflectors in the air tube impart a circular motion to the combustion air stream, assuring thorough mixing of air and atom-



ized oil. The air guide deflectors and nozzle pipe are adjustable—forward or backward.

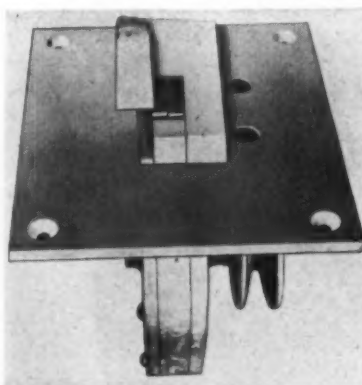
The burner is automatic—a thermostat controls room temperatures, a special limit control prevents overheating and a primary control operates the burner and transformer—with provision for safety shutdown.

The C-7 conversion burner is available in seven capacities depending on the nozzle size. It is adaptable to furnaces in the small home heating field, and will operate on kerosene, light oils (No. 1, 2 or 3 fuel oil) or catalytic oils under CS-12 specifications.—York-Shipley, Incorporated, York, Pa.

Power Shear.....79

A small power-driven shear has been designed for mounting flush with the top of a work bench—powered either by V-belt and motor or an electric drill motor mounted underneath the bench.

The unit is adaptable for slitting,



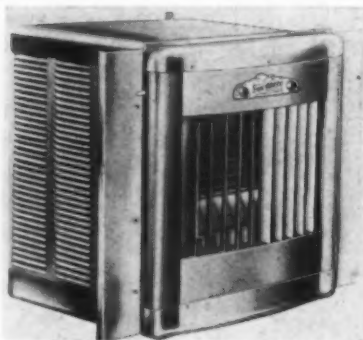
trimming and contour cutting of sheet metal. Operator can follow straight or curved lines to a radius of about three inches in 18 ga. mild steels.

Unit is 6¼ in. high, with bed plate 5 x 6 in. It weighs 6½ lbs.

Besco Mfg. Co., Dept. AA, 519 Main St., Cincinnati 2, Ohio.

Evaporative Cooler.....80

A new Sno-Breze evaporative air cooler, the 18B48 window blower type, has been designed for small homes, apartments, and tourist courts. The cooler is balanced on the window sill and metal side



panels are adjustable to fill in any space between the cooler and window.

The Sno-Breze is powered by a 1/6 hp heavy duty, quiet-running motor; has a 22-ga. rust resistant, press formed cabinet; removable rear louvred panel; a trough-type

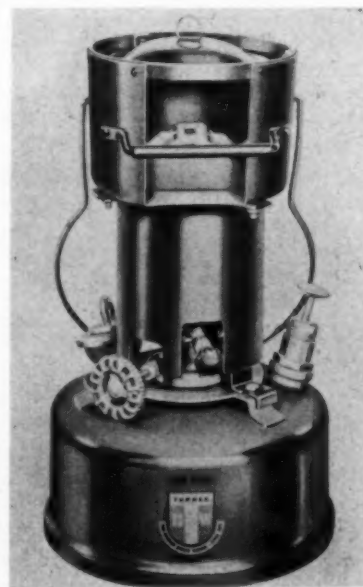
water distributing system with automatic water regulator; super cooling Sno-Fluf aspen evaporative pads; sag-proof pad holders; and newly designed recessed adjustable front grill. A copper tubing water connection, a garden hose drain, and a plug-in receptacle complete the installation. Operation is by switch and water control valve on the front panel. Finish is a furniture blending light brown baked Hammertone enamel.

The Sno-Breze cleans, cools and filters 1800 cfm. Overall size is 23½ W x 26 H and 23-in. D.—Palmer Manufacturing Corporation, 705 W. Jefferson St., Phoenix, Ariz.

Tinner's Fire Pot.....81

A new low-pressure tinner's fire pot (No. 475) which is smokeless, sparkless, and sootless is being manufactured.

This model is complete with "Carburetor Control" for more perfect



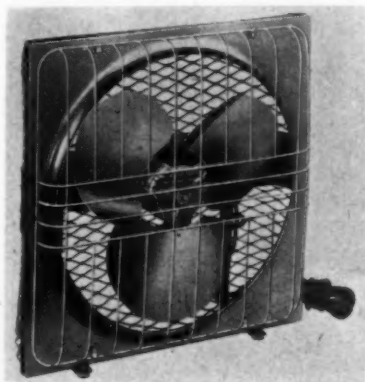
combustion; also a flame control for exact amount of heat desired. A special soldering iron rest keeps points of soldering coppers out of direct flame, thereby saving retinning.

Other features include burner coil of extra heavy seamless steel tubing, protected by sturdy outer jacket that maintains heat without overheating; automatically controlled orifice cleaner; quick, easy accessibility for cleaning—windshield, top plate, and bail handle are one unit, and can be lifted from tank by loosening one wing nut.

The Turner Brass Works, Sycamore, Ill.

Lau Fan.....82

The P-18 portable fan has been redesigned for efficiency, appearance and adaptability. It can be used in a window or a transom. The new P-18 is equipped with strong



handle to facilitate moving. Finished in rich surf green enamel and chromium trim.

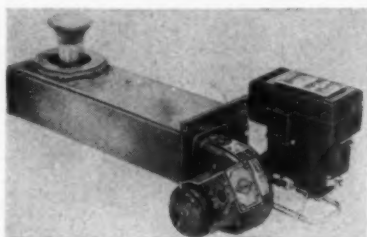
Only 22 5/16 in. square and 7 11/16 in. deep, yet delivers 1800 cubic feet of air per minute. Its position can be reversed at any time, thus enabling air to be pulled in or out as desired.

Net weight 25 pounds—shipping weight 30 pounds.

Furnished with 8 foot cord and plug.—*The Lau Blower Co., Dayton 7, Ohio.*

Vaporizing Burner.....83

The Ball Flame oil burner, Model Set, is a vaporizing type designed for small homes requiring an input of .6 to 1.5 gph. A small specially constructed heavy-duty motor, connected to a balanced aluminum fan, supplies air to support combustion through a heavy galvanized iron duct, or "air-box," to a specially



designed cast iron vaporizing chamber. The vaporized oil is burned in suspension in the space between two circular chrome steel shells which are perforated to meter just the correct amount of primary air through the outer shell,

and secondary air through the inner shell.

The top of the inner shell is provided with a cast refractory "mushroom" which acts as a flame spreader and, as it is heated to high temperature, helps volatilize the oil vapor. The oil is fed to the vaporizing chamber through a constant level valve. This valve also acts as a safety control.

The Ball Flame burner is automatic—controlled by the thermostat and low limit control. Underwriters' Laboratories' tested and approved.—*Kresno-Stamm Manufacturing Co., 345 Commercial Ave., Palisades Park, N. J.*

Smokeless Furnace.....84

The Minute Smokeless furnace has been developed primarily to meet the requirements of anti-smoke ordinances. These furnaces are semi-automatic. A full day or night supply of oil-treated dustless coal is placed in the furnace by hand. Burning is controlled through draft dampers operated by a thermostat.

The movement of one lever dumps the ashes into an ash con-



tainer; another lever transfers the remaining incandescent coke; and coal is then poured into the furnace. When the ash receiver is full, a lid is placed and it is carried out like a suitcase.

Any kind or size of coal can be used, up to the size of the fist.

This coal burning plant turns soft high volatile coal into a coke by transforming the coal into gas and burning it as it comes from the coal. The remaining coke continues to heat the house for several hours.

Worsham Company, Incorporated, 7329 Lohmeyer Ave., St. Louis 17, Mo.

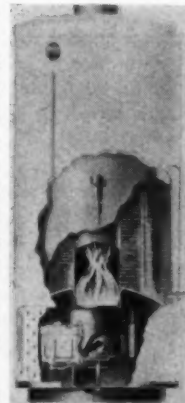
Water Heater.....85

A new automatic oil-burning water heater is announced with the controls enclosed within the casing.

A low draft burner concentrates a swirling-action flame at the base of the flue casing and rests on a screw-jack support to permit quick and easy lowering for servicing. The "Magic Pilot" with in-built anti-flooding device is not affected by variable drafts.

Thermal bulb automatically controls water temperatures 125 to 185 deg F. A thick jacket of Fiberglass insulation on top and sides.

A magnesium alloy anode with special current-limiting resistor is another feature. The Gillen Water Heater is available in 30 and 45 gallon sizes, finished in baked white enamel, trimmed with stainless steel.—*J. L. Gillen Company, Dowagiac, Mich.*



Oil Furnaces.....86

Two new Thatcher furnace models—550 and A-204—both oil-fired automatic winter air conditioners, are rated at 63,300 Btuh and 65,600 Btuh capacity at the register, respectively.

The A-204 is 36 in. high, 23½ in.



wide, 39¾ in. long, weighs less than 275 lbs. and is completely packaged for installation in the basementless house.

The 550 has a modern natural aluminum casing.

Thatcher Furnace Company, Garwood, N. J.

EQUIPMENT DEVELOPMENTS

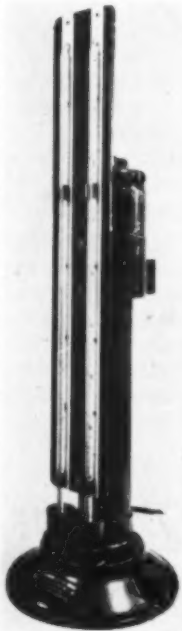
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Psychrometer87

An electric motor-driven, humidity measuring device, reading temperature deviations within one-fifth of a degree, uses matched wet and dry bulb thermometers with scale readings from 40 to 120 degrees Fahrenheit.

Included with the instrument is a large psychrometric chart so that the wet and dry temperature readings may be translated into precise relative humidity percentages.

The complete instrument, in addition to the psychrometric chart, includes a wick, thread, scissors, a bottle of distilled water, carrying case, and—if desired—an adapter over the thermometer bulbs of the matched thermometers so a tube could be inserted into the duct work, thus obtaining humidity readings by drawing the air from the enclosure by the use of the fan of the psychrometer itself. — *Minneapolis-Honeywell Regulator Company, 2726 Fourth Avenue South, Minneapolis 8.*



Oil Burner88

The Metro-Matic oil burner with the removable head is offered in three models. The motor is heavy duty; a balanced blower fan is mounted on the motor shaft; a bell-blast air diffuser of the venturi type provides the air turbulence necessary for air-oil ratio; a Mist-Master stainless nozzle breaks the oil into microscopic particles; the main housing is aluminum casting; rotary oil pump, pressure regulator,

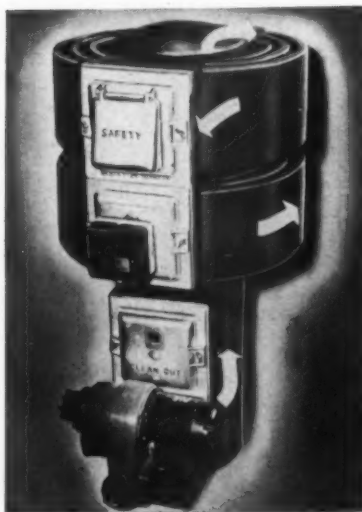
oil filter assure flow of oil; nichrome steel electrodes are easily removable; Rite-Air air meter controls the intake of air to the Bell-Blast air diffuser; an electro-statically shielded transformer provides 10,000 volt output for positive spark; and a heavy, solid base is adjustable.—*Metromatic Oil Burner Co., 21 Henderson St., Everett, Mass.*

Redesigned Furnace89

The R.F.C. oil furnace line has been redesigned with a patented double radiator or heat exchanger. The hot gases rising to the top of the combustion chamber first circulate through the upper section of the heat exchanger and then overflow into the lower section, passing through the lower section before going into the chimney.

Every unit is equipped with cleanouts. There is also a safety blowout, repair openings and a special precast refractory that is poured into the combustion chamber at the factory.

The units are enclosed in a streamlined baked enamel cabinet



with standard equipment, including a high pressure gun burner, combination controls, blower, motor, filters, humidifier, and draft control.

Capacities are 85,000, 110,000, 150,000 and 200,000 Btuh at the bonnet. All units will feature the double section heat exchanger but will have, in order of capacity, one, two, three and four circular flues on each section of the radiator.

—*Radiation Furnace Corp., P. O. Box 613, Benton Harbor, Mich.*

Time Switch90

The Type S Time Switch is powered by a newly developed high torque, synchronous, self-starting, low speed motor that is lubricated for life. The switch is designed for easy mounting on a standard switch



box, or for surface mounting on any wall. The overall dimensions are approximately 3 in. wide, 5 3/8 in. high and 3 in. deep. It is approved by the Underwriters Laboratories.

The new S switch is available in two attractive colors, Ivory or brown. The metal base is color matched to the plastic cover.—*Sangamo Electric Company, Springfield, Illinois.*

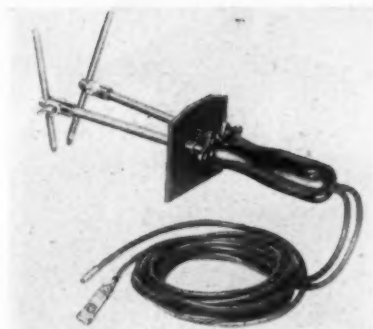
Code Wire Markers91

E-Z Code wire markers are self-adhesive identification labels, pre-printed in numbers 1 to 99, in the letters of the alphabet and in the ASA and NEMA codes. In application, the manufacturer attaches the markers to wires, cables and terminals, establishing a permanent



record of the hook-up. When the equipment is assembled, the correct wiring can be identified at a glance, thus eliminating errors and speeding the process.

—*Western Lithograph Company, 600 E. Second St., Los Angeles 54, Calif.*



Carbon Torch 92

A carbon arc torch for use with AC welders has been designed to extend the use to jobs where the application of heat is desired without melting the metal being worked on.

The torch is equipped with two cable leads—one to be clamped to the welder's electrode holder, and the other has a spring clip that clips to the welder's ground lead. The handle is made of thermal plastic.

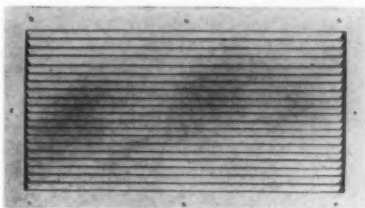
The carbon holder jaws will hold either a 5/16 or 3/8 in. diameter carbon without adapters or special extra jaws.

With an AC welder, the arc torch can be used for all types of brazing and soldering work, general heating, as well as hard surfacing of thin materials.—*The Lincoln Electric Company, 12818 Coit Road, Cleveland 1.*

Louvaire Grille 93

The Louvaire Grille was designed primarily for installation in doors or partitions.

The horizontal, herringbone shaped bars of the Louvaire permit constant passage of air for



ample ventilation and at the same time forms a grille which restricts vision.

The Louvaire has been designed in three main types.

Type C consists of core only and is installed with wood molding.

Type F consists of core with frame attached on one side only,

and is intended for use in closet doors.

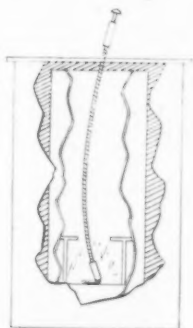
Type FS consists of core with two frames—one attached, one loose.

Louvaire grilles are made in all standard and extra-large sizes and can be had in special color or plated finishes.

Stewart Manufacturing Company, 610 Bloomfield Avenue, Bloomfield, New Jersey.

Heetrliter 94

The Heetrliter has been designed for lighting oil circulating heaters, floor furnaces, etc. The wick is hinged so that it will lie flat in the



oil. After lighting the burner, the wick is pulled back, snuffing out the flame. Shafts are of flexible material, and of various lengths.

The Heetrliter Co., 600 1/2 First Street, Newberg, Oregon.

Controls 95

In the history of forced warm-air heating, "cold 70," stratification, drafts, cold floors and uneven heating have been characteristic of systems employing intermittent operation. The solution is in the use of the Microtherm control system, which employs a thermostat responsive to room temperature changes of as little as 1/10 of a degree, and a master control which "floats" the air delivery temperature up or down in small increments to exactly offset the heat loss in existence at the moment.

Cold air is constantly drawn from the floor, and warm air precisely modulated to the right temperature is continuously and gently circulated.

Microtherm controls will be furnished as standard equipment with the Crest-aire complete line of oil,

gas and coal fired forced air units. Details are available.—*Crest Industries, 75 E. Wacker Drive, Chicago 1, Illinois.*

Industry Heaters 96

Two Ivanhoe radiating heaters—polished steel with enclosed bases finished in black Japan—have been designed to heat stores, warehouses, construction jobs to dry out plaster, on loading docks, etc.

Model 2050 Ivanhoe oil-burning heater is equipped with Perfection's patented Multi-Heat burner and Midget pilot. The Midget pilot burns for more than an hour on

less than a half cup of fuel. The 2050, with 50,000 Btu per hour output, is equipped with automatic draft regulator, combination oil control and constant level valve and fuel line clean-out rod.

Model 2030—30,000 Btu per hour output—has a self-vaporizing burner and automatic draft regulator, and is furnished with a 3-gallon removable reservoir.—*Perfection Stove Company, 7609 Platt Ave., Cleveland 4, Ohio.*



Counterflow Conditioner .. 97

The GUC CounterFlow oil-fired winter air conditioner has an all steel combustion chamber, high pressure drawer type burner with fuel pump, drawer-type firebox, built-in Anti-Pulsator to prevent starting vibration, circulating blower provides 1800 cfm, spun glass filter, evaporating or automatic humidifier, CounterFlow baffle, one-piece steel base under entire unit, and colorful enameled casing.

Controls consist of fan and limit switch combination, master switch, stack safety switch and room thermostat.

Burner approved by NBFU. Built in accordance with ASME code.

The GUC CounterFlow is designed and built by *General Utilities Corporation, 1520 N. Broad St., Philadelphia 21.*

EQUIPMENT DEVELOPMENTS

Use the coupon on Page 121

Chillchaser 98

The Thermomatic Chillchaser has been designed to allow an exceptionally large radiating surface. The heat exchanger is cast iron, and in one piece.



The unit has been designed around the fan. The heat exchanger consists of a series of concentric, radial, inverted venturi tubes. The speed and volume of the fan becomes greater as you go outward from center. The Radial-Flow heat exchanger has a greater radiating surface as you go outward from center in direct ratio to the fan. Also incorporated is the patented, circular, concave venturi diffuser. This system directs the flow of air radially, vertically, and horizontally at the same time.—*Thermomatic Corporation, Church & Elm Sts., Willoughby, Ohio.*

Paint Scraper 99

The Red Devil paint scraper has a specially designed blade of Carboloy cemented carbide, a metal approaching the diamond in hardness. This Carboloy blade is held in



the rust proof scraper handle with a set screw. The four working edges of the blade, plus the four individually shaped corners that fit into any corner or molding, enables the tool to scrape fast and clean; and to stay sharp longer. The blade is so positioned that it has no tendency to dig into the base material. The blade can be set in the holder

so as to protrude varying amounts to right or left. It can be adjusted to utilize any of its four specially shaped corners. The blade can be ground or honed on any fine-grained silicon carbide wheel or stone, or a new blade can be inserted.—*Carboloy Company, Inc., 11177 E. Eight Mile Road, Detroit 32.*

Fire Pilot 100

The Thermo-Interruption feature of the new Fire Pilot is designed to help the coal and stoker industries by allowing the use of a wider variety of coals, and to achieve greater economy with top quality coals.

The Thermo-Interruption Fire Pilot performs the normal fire pilot functions, convenient knob adjustments permitting 1 to 4 firing periods per hour, each of 1 to 7 minutes duration. In addition, the



Fire Pilot provides similarly scheduled interruptions during the firing cycle itself. It may be set to cause 0 to 7 minute pauses in the firing 4 times per hour. Interrupting the firing cycle provides improved combustion, eliminates coke trees, and the accumulation of unburned coal in the fire box. By enabling the burning to keep pace with firing, thermostat "over-ride" is reduced.

Sampsel Time Control, Inc., Spring Valley, Illinois.

Ignition Transformer 101

A standardized transformer especially designed for oil burner ignition systems has been announced. Single-slot end mounting and built-in radio interference suppression are features.

Designed with mechanical features to fit many present oil burner

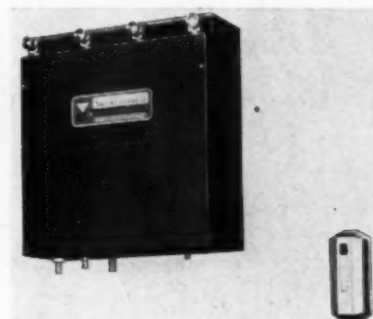


designs, this ignition transformer is available in quantity.

Convenient low-voltage knock-outs are provided on sides, end, and bottom. The unit has plug-type high-voltage bushings and a large, accessible low-voltage junction box. Strong mechanical construction and complete protection of low-voltage coils are furnished by a steel junction box partition.—*Specialty Transformer Divisions, General Electric Company, Schenectady 5, N. Y.*

Humidity Unit 102

A compact unit for humidification is announced ready for connection to air line, water line and electrical circuit. Four humidifying nozzles, water tank with float valve, water strainer, air filter, air regulator with



pressure gauge, and solenoid operated valve are built into a cabinet 13 $\frac{3}{8}$ by 14 $\frac{3}{4}$ x 6 inches. A humidistat for automatic control is included.

The unit will atomize 35 lbs. of water per hour, using 5 cfm of atomizing air supplied at 32 psi.—*Spraying Systems Company, 4021 W. Lake St., Chicago 24.*



Here's what the "unbeatable combination" can do for your customers

● Modern hard coal stokers and plentiful anthracite are an unbeatable heating combination. This pair offers your customers these important benefits.

Completely Automatic Heat—Modern hard coal stokers are fully automatic... from bin feed to ash removal. Sensitive thermostatic controls respond to the slightest change in temperature. They go to work immediately to send steady heat to every room.

Economical Heat—Stokers use the small, inexpensive sizes of hard coal. Thou-

sands of satisfied owners of anthracite stokers testify to reduced fuel bills... *as much as 50% lower!*

Plenty of Heat—A full year's supply of plentiful, small size anthracite can be stored in the cellar without danger or dirt. Every day regardless of the temperature outside, the house is healthful, comfortably warm.

Get all the facts on heating with all types of anthracite equipment including modern automatic stokers. Simply fill out the coupon and send it today.

Manufacturers of Approved Automatic Stokers

COOPER STOKER
ELECTRIC FURNACE-MAN
FAIRBANKS-MORSE STOKER
FUEL SAVERS STOKER
FURNACE TENDER STOKER
THE GILKOAL STOKER
IRON FIREMAN
MOTORSTOKER
NEWTON STOKER
STEWART-ROGERS STOKER
STOKOL ANTHRACITE STOKER
VAN WERT STOKER
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ANTHRACITE INSTITUTE

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Please send me more information on anthracite and anthracite heating.

Name

Address

Company

City Zone State

VITAL TOOL FOR *Management!*



Use it to
SPREAD
the national debt!

WITH MANAGEMENT BACKING, PAYROLL SAVINGS PLAN CAN HELP BUSINESS AND NATION

In 19,000 companies, the Payroll Savings Plan (for the regular purchase of U. S. Savings Bonds) has made employees more contented in their jobs—has cut down absenteeism—has even reduced accidents!

In addition, of course, the Plan builds financial security for each participant. Each Bond pays \$4 at maturity for every \$3 invested.

But the Plan has other, far-reaching benefits—to business and to the nation—which are equally important to you.

SPREADING THE NATIONAL DEBT HELPS SECURE YOUR FUTURE

The future of your business is closely dependent upon the future economy of your country. To a major extent, that future depends upon management of the public debt. Distribution of the debt as widely as possible among the people of the nation will result in the greatest good for all. How that works is clearly and briefly described in the brochure shown at the right. Request your copy—today—from your State Director of the Treasury Department's Savings Bonds Division.

WHY EXECUTIVE BACKING IS VITAL

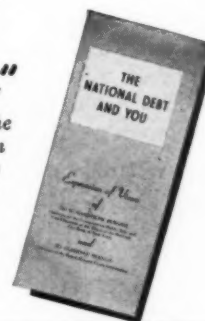
Employees still want the benefits of the Payroll Savings Plan. In fact, they *need* the P. S. P., because banks don't sell Bonds on the "installment plan"—which is the way most workers prefer to buy them. But wartime emotional appeals are gone. Human nature being what it is, the success of the Plan in your company is liable to dwindle unless a responsible executive keeps it *advertised*. The *reasons* for promoting it are as important as ever—to you, your company, and your country.

So—today—*check up* on the status of the Payroll Savings Plan in your company. *Act* on your responsibility to see that it is vigorously maintained.

The State Director will gladly help.

"The National Debt and You,"

a 12-page pocket-size brochure, expresses the views of W. Randolph Burgess, Vice Chairman of the Board of the National City Bank of New York, and Clarence Francis, Chairman of the Board, General Foods Corporation. Request your copy from the Treasury Department's State Director, Savings Bonds Division.



The Treasury Department acknowledges with appreciation the publication of this message by

AMERICAN ARTISAN

This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and the Advertising Council



QUESTION:
When you replace worn-out oil burners with Petro, what do you gain?

ANSWER:

UNWILLING to nurse along their present worn-out fuel-wasting oil burners, many homeowners are getting set to put in modern equipment that can and does give most heat with least fuel.

That means Petro . . . for every reason you can think of. To the homeowner a Petro brings such fuel-saving features as the patented "tubular atomizing nozzle." Plus basic design efficiency reflecting the more than 45 years' "know how" of the world's largest, oldest exclusive oil burner maker. Plus built-in sturdiness so essential to fine performance for years.

Add these benefits up in terms of owner satisfaction and you'll agree a Petro stands in front in promoting *any dealer's* reputation for quality merchandise and workmanship. For details on Petro oil burners, boiler-burner units, furnace-burner units and water heaters, see the established Petro heating and plumbing jobber in your wholesale trading area. Do it now!

PETRO
REG. U. S. PAT. OFF.
OIL BURNERS • BOILER-BURNER UNITS
FURNACE-BURNER UNITS • WATER HEATERS

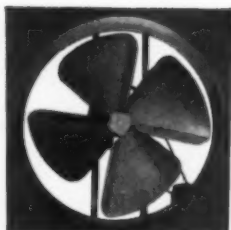
PETROLEUM HEAT AND POWER COMPANY
Stamford, Connecticut

Makers of Good Oil Burning Equipment Since 1903

REFINERIES FUEL OIL STORAGE AND DISTRIBUTION TERMINALS
NATIONWIDE OIL BURNER SALES AND SERVICE FACILITIES

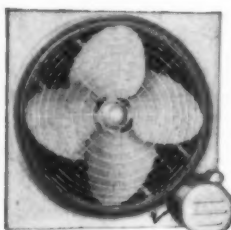
SCHWITZER-CUMMINS FANS and BLOWERS

give you

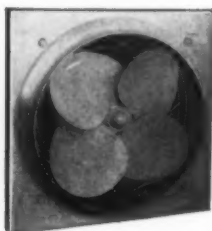


AIR HANDLING AT ITS QUIETEST BEST

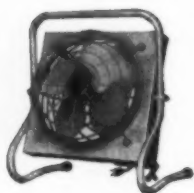
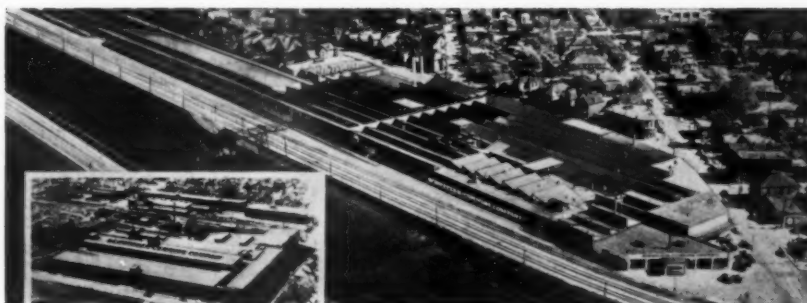
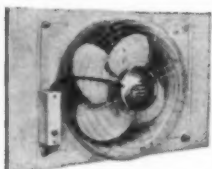
You will need the best there is in quality, performance and design in your merchandise for 1948, and all at a reasonable price. With prices what they are, you must have convincing value to offer. Schwitzer-Cummins Fresh-Air Maker fans and Hy-Duty blowers can't be beat for big air delivery, quiet operation, selling features and looks. You will like everything about them and will cheerfully O.K. this year's prices. And there are a surprising number of essential types and sizes to help you get the business and boost your profits.



- | | | | |
|---|-------------------|---|---------------------------|
| 1 | ATTIC VENTILATORS | 4 | ADJUSTABLE WINDOW FANS |
| 2 | WINDOW FANS | 5 | PORTABLE CIRCULATING FANS |
| 3 | EXHAUST FANS | 6 | DOUBLE INLET BLOWERS |



With our enlarged facilities we can now give good service to more dealers and distributors and have some prime territory open. We would like to present a portfolio of new literature descriptive of some very unique and interesting developments for this year's ventilating business. It is yours for the asking.



SCHWITZER-CUMMINS COMPANY

VENTILATING DIVISION

1145 EAST 22nd STREET • INDIANAPOLIS 7, INDIANA

ENGINEERS AND MANUFACTURERS OF FINE FANS FOR 30 YEARS

ceiling installation of warm air

Tyler S. Rogers House, Toledo, Ohio. Russell B. Johns, Builder.



Radiant Panel Heating

provides many practical advantages



Hooks are attached to the true ceiling-joists to carry cross ties for metal lath. Notched sheet-metal baffles are also hung from the hooks to control direction of warm air flow with the hung ceiling.



Metal lath in position, before application of scratch and finish coats of plaster.



Attic view shows insulated supply ducts that connect via warm-air inlet boots to the ceiling panels below. Sealed insulation board is used to form top of ceiling plenum. Uninsulated pipe at right is exhaust for kitchen ventilating, not connected with heating system. Photograph taken before insulation was installed between joists.

FOR new, single floor, ranch type houses, here's a radiant panel warm air heating system that provides *practical advantages* to the heating contractor, builder and home buyer.

And, here's a system that puts the warm air heating contractor "in business" with a *practical application* of highly publicized radiant heating.

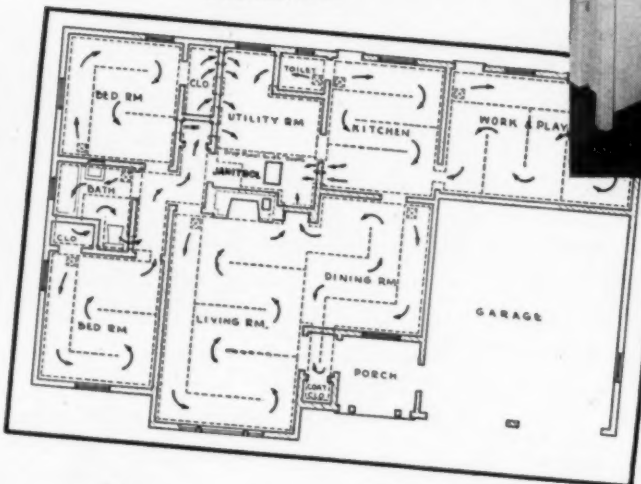
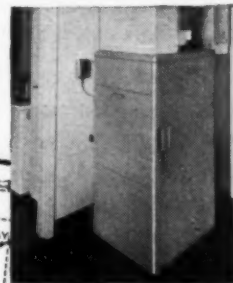
Use of circulated warm air provides quick and automatic response to outdoor temperature changes. Using the *entire ceiling* as the radiant panel, assures even and constant heat distribution that is also remarkably flexible. Important to the contractor, builder and home

buyer alike, is that there is *nothing that might require future service inside the heat distribution system.*

It will be seen that this practical form of radiant panel heating must be designed into the home building plans and that the proper use of insulation is important.

The proved results of this Panel-aire System using a Janitrol Gas-Fired Winter Air Conditioner, make it worth your while to study its application to the types of houses your customers and prospects are building. Write us for a copy of the Installation Code Manual 7-A published by National Warm Air Heating & Air Conditioning Assn. Enclose 30¢ to cover costs.

Compact and neat, Janitrol 120,000 Btu/hr. Gas-Fired Winter Air Conditioner, requires less than 30" x 30" floor space in the utility room.



The dotted lines on the floor plan show the scheme of baffles built within the hung ceiling. Arrows indicate direction of air flow over room areas and into the outlets, which return the air to the Janitrol unit for reheating and recirculation.

Janitrol

SURFACE COMBUSTION CORPORATION, TOLEDO 1, OHIO



... ONE OF THE "BASIC 6" THAT MAKE
CHRYSLER AIRTEMP A BETTER LINE TO SELL!

• Products to sell, profits to make, 12 months of the year! That's what Chrysler Airtemp's line of air conditioning, heating and commercial refrigeration equipment means to dealers.

This is just one of the "Basic 6" factors essential to a profitable dealership. And when you handle Chrysler Airtemp, you have *all 6*! Before you decide, see how much more Chrysler Airtemp offers you—get the details on the "Basic 6". Now is the time to act—mail coupon today.

**"THE
 BASIC 6"**

**ESSENTIAL FOR A PROFITABLE
 DEALERSHIP!** *CHECK THEM—*

1. Products Engineered for
Finest Performance
2. Ample Facilities for Engi-
neered Production
3. A Well-Known and Reli-
able Name
4. Products to Sell Every
Month in the Year
5. Factory-Trained Sales-and-
Service Personnel
6. National Advertising and
Sales Promotion that
Bring Results

Airtemp Division of Chrysler Corporation
 Dayton 1, Ohio
 Please provide me with information concerning Chrysler
 Airtemp dealer agreements. (A-A-4)

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 I am interested (check) Heating _____
 Cooling _____ Refrigeration _____



**AIR CONDITIONING • HEATING
 COMMERCIAL REFRIGERATION**

AIRTEMP DIVISION OF CHRYSLER CORPORATION
 Dayton 1, Ohio
 In Canada: Therm-O-Rite Products, Ltd., Toronto

AMERICAN ARTISAN, April, 1948

YOU CAN BE SURE OF

Efficient **Performance** *with*

MURRAY ATTIC FANS



*"The fan
that does its work
in a Whisper"*

When you install a Murray Attic Fan, you can be sure of efficient performance. Murray Attic Fans are manufactured in our own plants under rigid control. Scientifically designed, Murray Attic Fans are engineered to provide maximum ventilation and steady air flow with minimum sound. Ideal for homes and business structures, Murray Attic Fans are made in four sizes to meet all needs. And Murray Attic Fans are priced to move fast. Write us for complete information about Murray Attic Fans—the fan that does its work in a Whisper.

To Help Increase Your Sales

SUCTION BOX AND GRILL PACKAGE: Specially designed Murray Suction Box complete with Grill and everything else you need for most fan installations. A unit package available in three standard sizes.

MURRAY SALES INCREASES KIT: Includes Installation Manual, Newspaper Mats, Consumer Folders, Radio Announcements, Suggestions for increasing your sales — all pre-tested sales material available free to Murray Attic Fan dealers.

THE MURRAY COMPANY

ATLANTA, GEORGIA

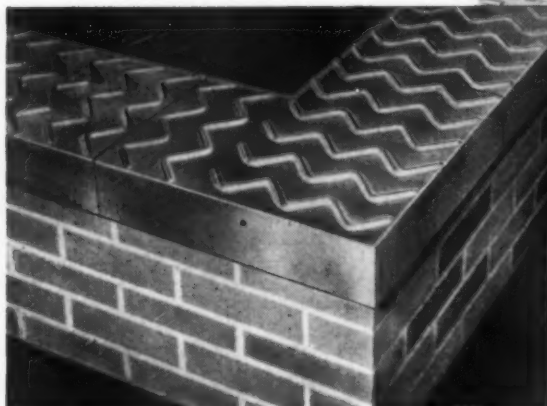
Established in 1900

DALLAS, TEXAS

Anaconda

THROUGH-WALL FLASHING

**drains itself dry
on a level bed**



Wherever through-wall flashing is specified, as it should be for parapets and all masonry walls, this patented Anaconda flashing offers you both efficiency and durability.

Sheet metal men like the die-stamped dam and corrugations that make this flashing easier and faster to lay. End joints are made simply by overlapping and nesting one corrugation. The flat selvage permits neat, sharp bends for counter flashing, without danger of distortion that might spoil drainage. Die-stamped corner pieces (for both inside and outside corners) are nested in place as easily as the straight lengths.

Another important advantage: the embossed dam and zig-zag ridges provide a complete mortar bond in all lateral directions.

Famous as the flashing that "drains itself dry on a level bed", architects and owners approve of Anaconda Through-Wall Flashing because it provides positive, controlled drainage and, being made of Anaconda Copper, long life is assured.

Literature on request.

4856



Anaconda

COPPER

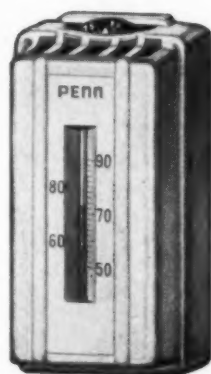
THE AMERICAN BRASS COMPANY
 General Offices: Waterbury 88; Connecticut
 Subsidiary of Anaconda Copper Mining Company
 In Canada: ANACONDA AMERICAN BRASS LTD.
 New Toronto, Ont.

EXTRA PROFITS

FOR YOU IN
THIS FUEL SAVING
CLOCK



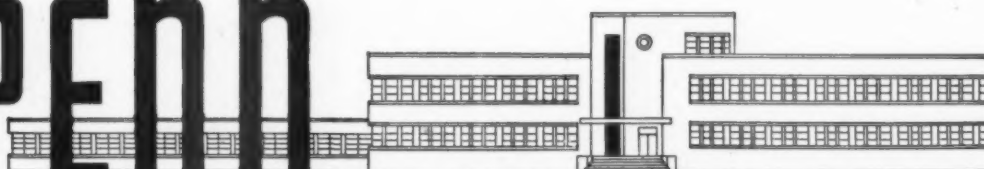
DAYTIME COMFORT • • NIGHT ECONOMY



Sell Penn Tem-Clock *now*—help your customers save fuel and help yourself to extra profits. This handsome electric clock may be mounted in any room, where a dependable time-piece is wanted, *regardless of thermostat location*. Tem-Clock automatically sets back temperature at night, restores it to comfort level in the morning. Time settings are easily made and quickly changed as desired by externally-mounted dials.

Penn's heat anticipating thermostat holds temperatures to selected levels, avoids "cold 70" as well as wasteful over-runs. Here is a "team" that provides maximum heating comfort and economy—that *saves money for customers, makes money for you*. For details see your wholesaler or write **Penn Electric Switch Co., Goshen, Indiana**. Export Division: 13 E. 40th St., New York 16, U.S.A. In Canada: Penn Controls Ltd., Toronto, Ontario.

PENN



AUTOMATIC CONTROLS

FOR HEATING, REFRIGERATION, AIR CONDITIONING, ENGINES, PUMPS AND AIR COMPRESSORS

WHAT IS THE PIPE SITUATION?

Of necessity, these words are being written soon after the middle of March.

The miners are out, again.

Industries, including steel, are halted.

Trains have been cancelled . . . thousands of men who want to work are being laid off for lack of materials or work to do.

How long will it last? . . . How much will the shut-down amount to at its worst?

IF you don't have the answer to those two questions by the time you see these words, it will be bad for all of us!

Believing that you who buy and use

HANDY PIPE

would rather read sober honesty than exuberant promises that cannot be backed up with immediate shipment of your orders, we say to you:

We are making — and will continue to make and ship — every section of our products that availability of materials makes possible, regardless of when the miners again become “able and willing.”

To promise you more, would be unintelligent.

F. MEYER & BRO. CO.

PEORIA, ILLINOIS

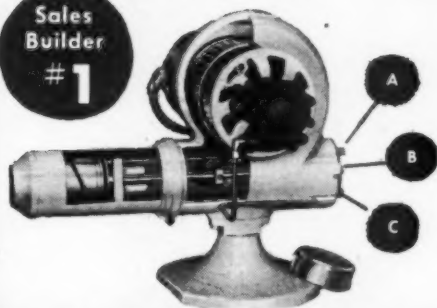
P.S. As this issue of the American Artisan goes to press, the miners are still out—but we hope they will be back on the job when you see this. America needs coal.

KORTH

Advanced Engineering
has the whole trade talking!

CAT-COMB SPIRALATOR BURNER—EXCLUSIVELY PRODUCED BY KORTH

Sales
Builder
#1



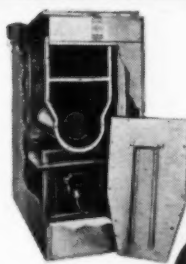
Burner and spiralator designed as one unit to efficiently burn the heavier catalytic fuel oils. It's practical—It's simple—It's service free. All guess-work is eliminated. Knobs: "A" Sets vacuum breaker disc. "B" Moves nozzle jet line and vacuum disc forward and backward. "C" Increases or decreases secondary air discharge area. All adjustments made on the outside of the burner while in operation. Phosphorous bronze spring clip ignition connections made automatically, permitting removal for inspection and nozzle change by simply sliding thru back plate opening. Korth Cat-Comb Spiralator Burner taps a tremendous replacement market for you during this period of oil shortage. It is exactly what the public wants. It SAVES over 20% in fuel cost.

PACKAGED KORTH-AIRE WINTER AIR CONDITIONER

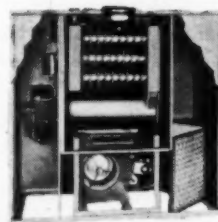
with the Exclusive Finned Tube Exchanger

Acclaimed at both the New York and Chicago Shows
as the greatest advance in forced air heating.

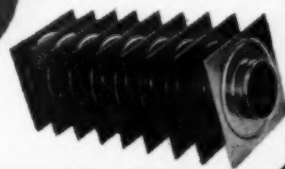
AIR-FLOW FINNED TUBE FLUE TRAVEL •
AIR-FOIL AIR-TRAVEL • INSPECT-O-PANEL



Sales
Builder
#2



Units shipped completely assembled—blower, burner and controls wired up. CUTS
INSTALLATION COSTS—SAVES TIME AND MONEY • Take advantage of this wonderful
opportunity to capture the home building market now available with KORTH-AIRE PACKAGED
UNITS • Korth-Aire is a masterpiece of advanced engineering making it extremely saleable.



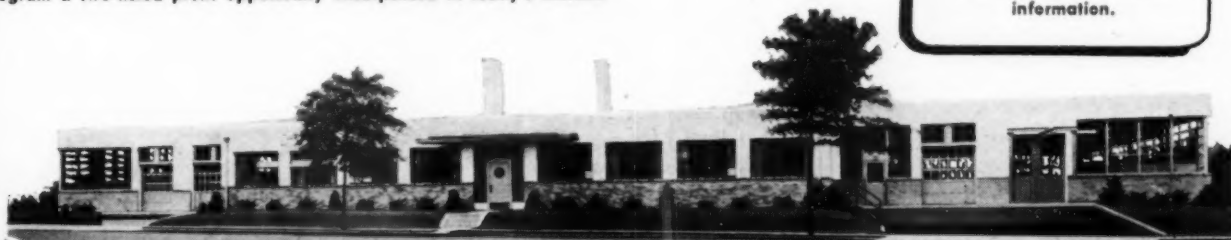
Sales
Builder
#3

KORTH STEEL HEATING UNITS

• Compactly designed for ECONOMY and DEPENDABILITY • Built-in large capacity copper tankless water heater.
Provides abundant hot water at all times • Heavy quarter inch steel plate construction, electric welded into one compact
unit • Ample heating surface and gas flue travel • Made in seven sizes for steam, water, radiant panel and other type heating • At-
tractive, two tone insulated casing, encloses oil burner and controls • Guaranteed for FIVE YEARS against leaks due to defects in
manufacture.

ALL COMPETITIVELY PRICED—these superior KORTH products will give your sales
program a two-fisted profit opportunity unsurpassed in today's market.

PHONE • WIRE • WRITE
immediately for detailed
information.



ECKHART

MANUFACTURING COMPANY
"For Over a Quarter of A Century"
ROSELLE • NEW JERSEY

IMPROVE YOUR KNOWLEDGE OF AIR CONDITIONING

SEND TODAY FOR
Samuel R. Lewis'

"AIR CONDITIONING FOR COMFORT"

288 Pages—6¼" x 9¼"—Illustrated—
Cloth Bound—\$2.00

Here is a book that presents—in simple, readily understandable form—every kind of information necessary for an accurate and thorough knowledge of air conditioning principles, equipment and practices. Written by S. R. Lewis, a widely-known consulting engineer who has been active in air conditioning work for more than thirty years, it deals with all angles of the air conditioning subject from the practicing engineer's viewpoint. The designing procedures explained in the book are, for example, in every detail the same procedures employed today by the author's own organization.

Featuring this third edition are chapters on phases of the subject not previously treated, including noise control, air conditioning measurements, air conditioning standards, fire protection codes and operating suggestions. Several complete examples of correct design procedure are given, together with forms for recording the design data, the proper filling-in of which are explained step-by-step.

The chapter devoted to Psychrometry presents nineteen different formulas for psychrometric calculations. In illustrating the correct use of these formulas, Mr. Lewis applies both the psychrometric tables and charts in order to render both devices thoroughly understandable.

OF VALUE BOTH AS A REFERENCE AND TEXT

Engineers in air conditioning will find the "Air Conditioning for Comfort" invaluable as a reference book, while salesmen, students, and others may rely on it to give them a clear knowledge of fundamentals, and of air conditioning methods and equipment.

Send for a copy today. We know you will consider this volume one of the most readable and complete books on the air conditioning science you have yet seen. You will risk nothing in ordering a copy, for you will be privileged to return it for a refund if for any reason it should prove unsatisfactory. Use the coupon at the right to order your copy now.

KEENEY PUBLISHING COMPANY

6 N. Michigan Ave.

Chicago 2, Ill.



\$2.00

CONTENTS

- CHAP. 1—Terms used in Air Conditioning
- CHAP. 2—Heat and Air
- CHAP. 3—Air Conditioning Standards
- CHAP. 4—Air Conditioning and the Human Body
- CHAP. 5—The Psychrometric Table and Chart
- CHAP. 6—Humidity Controllers and Control
- CHAP. 7—Heat Transmission Through Barriers
- CHAP. 8—Ventilation, Solar and Appliance Heat
- CHAP. 9—Heating Systems
- CHAP. 10—Air Conditioning Systems
- CHAP. 11—Air Conditioning Apparatus
- CHAP. 12—Refrigeration and Refrigerants
- CHAP. 13—Refrigeration Compressors and Condensers
- CHAP. 14—Refrigeration Evaporators and Auxiliaries
- CHAP. 15—Record Forms for Heating and Cooling
- CHAP. 16—Air Distribution
- CHAP. 17—Water in Air Conditioning
- CHAP. 18—Noise and Its Control
- CHAP. 19—Air Conditioning Instruments and Measurements
- CHAP. 20—Codes and Operating Suggestions
- 10" x 16" Psychrometric Chart.....
- Inside Back Cover

KEENEY PUBLISHING COMPANY

6 N. Michigan Ave., Chicago 2, Ill.

Enclosed is \$2.00 for a copy of AIR-CONDITIONING FOR COMFORT. If this book should prove unsatisfactory, I will return it within 15 days for a refund.

NAME

STREET

CITY & STATE



**ANOTHER HEATING SEASON
ADDED TO THE DISTINGUISHED
RECORD OF PERFEX**

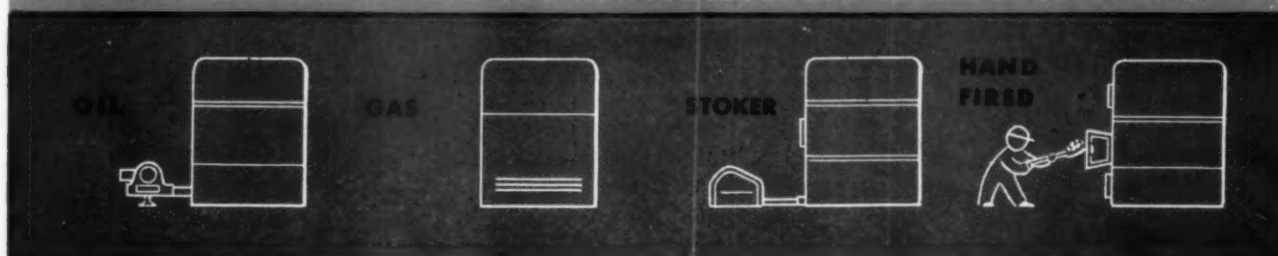
Twin Contact Controls

Reports from dealers everywhere testify to the unequalled dependability and freedom from service of precision-engineered Twin Contact Controls. Proof again, that the leading manufacturers of automatic heating are right in pre-selecting Perfex controls to bear their trade mark names.

PERFEX CORPORATION, MILWAUKEE 7, WIS. • Perfex Controls Ltd., Toronto 1, Ont.

 **PERFEX**
TWIN CONTACT CONTROLS

A COMPLETE LINE OF TWIN-CONTACT CONTROLS FOR ALL TYPES OF HEATING



New Flexible Duct Connector

PASSES 'ACID' TEST!

**Unaffected by 6-month exposure
to weather, sulfuric acid fumes
and constant vibration**

Really rugged is the new flexible Fiberglas* duct connector by Bauer & Black. Proof of its endurance may be seen in an unusual application at the Riverdale, Illinois, plant of Acme Steel Co.

Bauer & Black engineers tested the new connector on a huge ventilating stack over a galvanizing bath. Weather, sulfuric acid fumes, and heavy vibration from below had destroyed previously-used connectors in 90 days. But the Bauer & Black connector shows NO SIGN OF DETERIORATION after more than six months.

For elements of the connector, see the diagram. The Bauer & Black Industrial Adhesive Tapes used are unusual and practical because of two unique components:

- A.** *Backing of Fiberglas* Cloth—thin, super-strong, permanent. Resists heat, light, deterioration. Won't shrink or stretch.*
- B.** *Vulcanizable adhesive whose strength increases greatly under heat, and whose seal grows stronger with age. Sticks with a touch.*

Speedily installed, the new connector helps cut labor costs drastically. Fiberglas tapes and neoprene-coated fabric handle easily, conform readily, seal instantly, give a neat-appearing, airtight fit. The connector fills a long-standing need in heating, piping and air-conditioning.

WRITE FOR DETAILS

Full information on applications, source and price will be gladly furnished on request. The Bauer & Black flexible duct connector can save you time and money, improve your installations. Address Dept. T8.4 today. No obligation.



HERE ARE THE PARTS OF THE NEW CONNECTOR



Bauer & Black Industrial Adhesive Tape No. 281—Fiberglas fabric coated on both sides with vulcanizable adhesive. Gives airtight seal that grows stronger with age.



Neoprene-coated Fiberglas fabric—sturdy, airtight yet bulk-free.



Bauer & Black Industrial Adhesive Tape No. 263—Fiberglas fabric, coated on one side with vulcanizable adhesive. Like No. 281, stubbornly resists deterioration.

*Fiberglas (Reg. U. S. Pat. Off. by Owens-Corning Fiberglas Corp.)

Products of

BAUER & BLACK

Division of The Kendall Company • 2500 S. Dearborn St. • Chicago 16

Industrial Adhesive Tape

PRESSURE SENSITIVE

Production Short Cuts to Reduce Costs • Research to Speed and Improve Methods

Easy installation
"Weldseal" construction

FITZGIBBONS Directaire

Reg. U. S. Pat. Off.

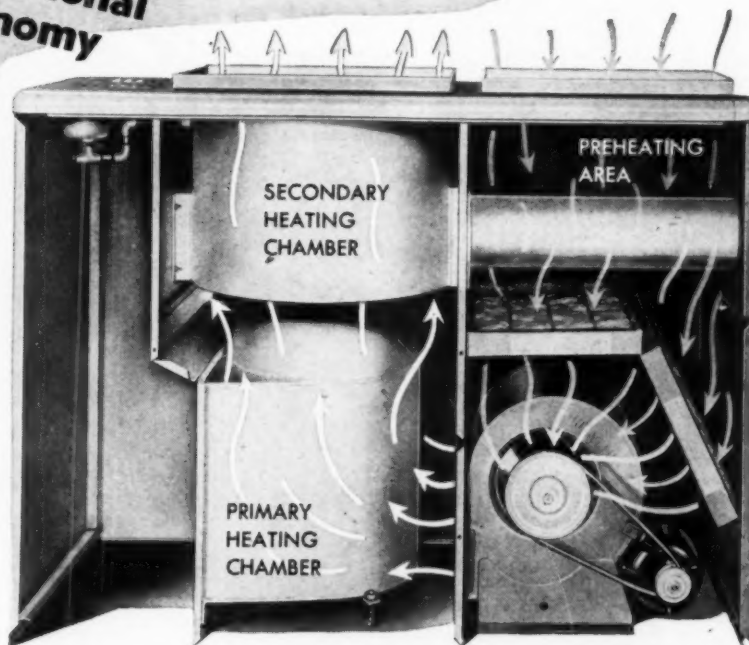
Exceptional
operating economy

Quick response to
thermostat demands

Quiet operation

Positive performance
in warming, cleaning
humidifying and
circulating the air

Ideal cooperation
with any good oil
or gas burner



FITZGIBBONS "CONTRA-FLO" CIRCULATION

as applied in the Directaire, is the developed result of Fitzgibbons 62 years in heat transfer engineering. With "Contra-FLO" circulation, the incoming (→) air flows through the unit in direction opposite (←) to that of the hot gases of combustion on their way out. Thus the new air is preheated even before it goes through the filter, and the additional heat it picks up is saved, instead of being wasted up the stack. This means reduced burner operation and lower fuel bills.

Built of heavy 11 gauge steel, permanently joined by Fitzgibbons "Weldseal" construction. Six sizes — 65,000 to 200,000 Btu/hr. Write for the catalog.

DEALERSHIPS — A few selected territories are still available.

SHIPMENTS — Delivery now on some sizes. Write or wire for prices, details.



Reg. U.S. Pat. Off.

Fitzgibbons Boiler Company, Inc.

101 PARK AVENUE, NEW YORK 17, N. Y.

Manufactured at: OSWEGO, N. Y.

Sales Branches in Principal Cities





TWO TYPES—
BOTH

*Peerless
Electric*

Belt drive assemblies with either top or rear mounted motor—with resilient bases to prevent vibration. Direct drive assemblies use specially-designed Peerless Electric capacitor motors—exceptionally efficient and quiet. Blower wheels, directly connected to motor, are forward curved, dynamically and statically balanced.



DIRECT DRIVE *Peerless Electric*
AIRBOY PACKAGE UNIT

Delivers 850 cfm, sufficient for a house of approximately 10,000 cu. ft.; 3-speed motor with motor blower unit rubber cushioned. Blower wheel dynamically and statically balanced; a very compact unit. The two motor bearings are the *only* bearings in the unit.

USE

*Peerless
Electric*

BLOWER ASSEMBLIES

in your FURNACES
and CABINETS

ELIMINATE service worries by installing Peerless Electric blowers for winter air conditioning and forced air heating.

Peerless Electric blowers—belt and direct drive types—are designed and engineered from more than 55 years of experience in building quality motors and electrical apparatus. Peerless Electric equipment is complete—manufactured entirely in our own modern plant—*not an assembled line*—and priced right, offering bigger profits to you.

Write for detailed information.

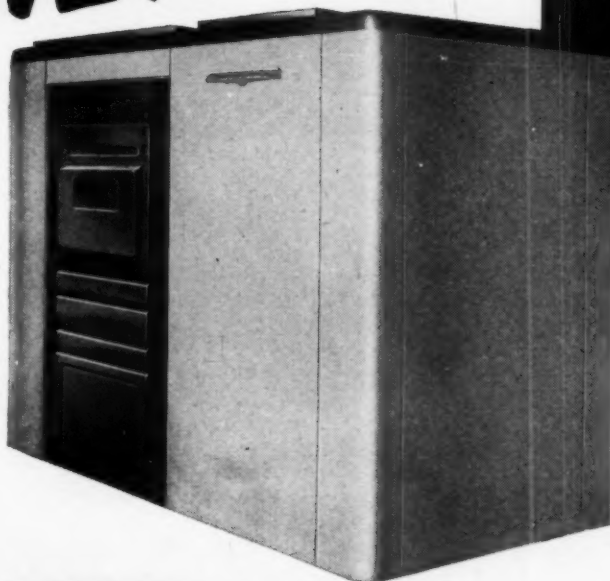
[THE *Peerless Electric* COMPANY
ESTABLISHED 1893 • WARREN, OHIO

MANUFACTURERS OF MOTORS
FANS AND BLOWERS

**SOLVES FUEL SHORTAGE
PROBLEMS! . . .**

NEW Norge Heat

CONVERTIBLE FURNACE



converts quickly

TO ANY FUEL!

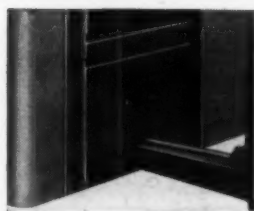
COAL - OIL - GAS

With factory designed firing-unit packages



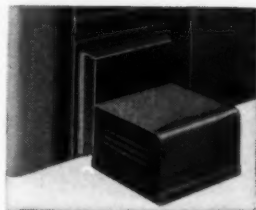
FOR COAL HAND-FIRING

Simply install "Package A" which includes: Large bar grates that burn either hard or soft coal with utmost efficiency. Waist-high, double-acting shaker. Pre-formed, high-temperature fire brick.



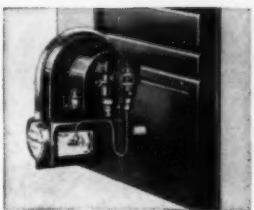
FOR COAL STOKER-FIRED

No change in basic unit! Extra large ash pit and electrically welded boiler-plate body make it ideal for use with conventional stokers.



FOR AUTOMATIC GAS BURNER

Quickly installed, "Package B" produces perfected gas heating. New automatic Air-Lock Gas Burner design forces clean flame low and out to combustion wall, then up for maximum fire travel. Completely automatic controls.



FOR OIL-BURNER

Made for easy installation, "Package C" contains famed "Whirlator" oil-burner to assure controlled combustion and utmost economy when using No. 1, 2 or 3 catalytic or straight-run fuel oils. Includes fully automatic controls.

NEW CONVERTIBLE AIR CONDITIONING FURNACE

Heavy-duty, all-steel body, electrically welded for gas-tight operation, long life, maximum heat recovery • Oversized radiator economizer for efficient heat transfer • Extra long flue passage assures economy with

any fuel • Big, fully-automatic blower circulates all air in house every 10 to 15 minutes • Rugged, quiet, motor • New, efficient filters • Beautiful cabinet, streamlined in baked tan enamel with maroon trim.

LEAD THE HEATING SALES

Nationally advertised Norge Heat equipment heads the entire heating field so you can "cream" the profits. Now!—Cash-in on this sensational convertible furnace . . . the

new "Whirlator" oil-burner . . . the long list of other Norge Heat exclusives. Norge Heat Div., Borg-Warner Corp.

Norge Heat

SEE **Norge Heat** BEFORE YOU BUY

Coal-Burning
Furnaces

Winter Air-
Conditioners

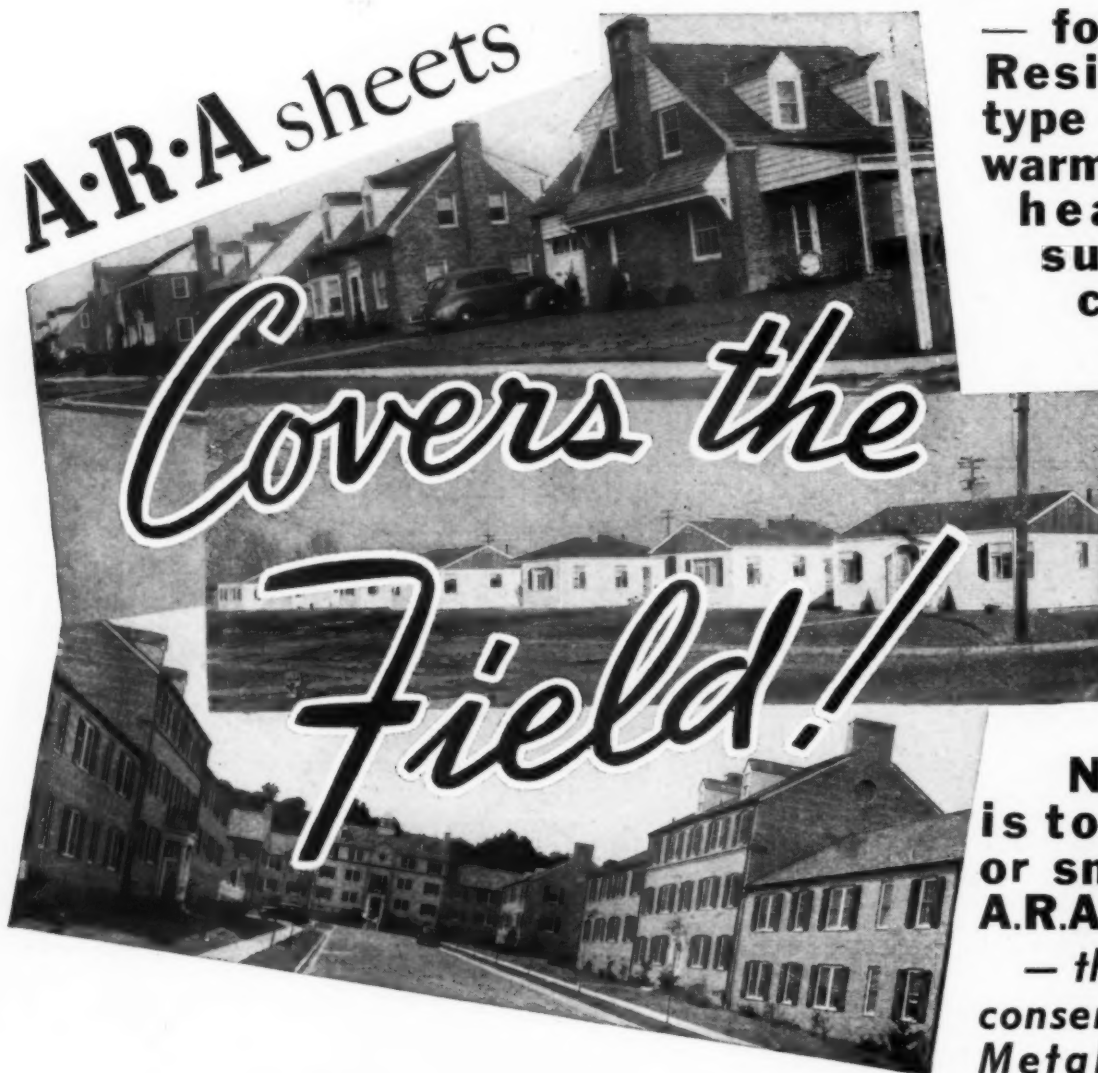
Replacement
Units

Oil-Burning
Furnaces

Oil-Burning
Water Heaters

Floor
Furnaces

A.R.A. sheets



— for every
Residential
type — with
warm air
heat or
summer
cooling!

No Home
is too large
or small for
A.R.A. Sheets
— they will
conserve your
Metal Supply

Non-Metal Duct Work

Today, when there just isn't enough sheet steel to satisfy demand, smart heating contractors conserve on their precious stock pile and use A.R.A. Sheets wherever possible on each job—large or small.

Certainly no finer Cold Air Returns can be made than from A.R.A. sheets—designed just the right size to cover 2 joist spaces perfectly. In one operation you get high insulating efficiency (K.45B.T.U.) and sound deadening qualities even metal ducts wouldn't give. They can also be profitably used for "long lines" rectangular or round where the metal saving is great. Besides, special fittings can easily be fabricated if desired from these remark-

able sheets. Our booklet explains how it can be done right in your own shop using your regular equipment.

These "tried and proven" easy working one man sheets are actually doing a big job—millions of square feet are being used each year. If you have been one of the few heating contractors who hasn't taken advantage of these light weight rigid sheets, start today—call your jobber—he'll take care of your requirements.

A.R.A. Sheets are NOW available although a sudden GREATER DEMAND could easily change our favorable position overnight.

20 Sheets 33" x 48" per carton weighing approximately 100 lbs.

Act Now—buy A.R.A. Sheets today and guarantee your future Air Conditioning and Heating business in these unpredictable times.

Get Genuine A.R.A. Sheets from Your Jobber

Write today for the free 16-Page illustrated Booklet

No. 894-A.

GRANT WILSON, INC.

141 WEST JACKSON BLVD. AT LA SALLE ST., CHICAGO 4, ILL.
22nd Floor, Board of Trade Bldg Phone: Wabash 8220

275,000

FLOOR FURNACES IN 1948*

YOU'LL GET A BIGGER SHARE OF THE
MARKET BY FEATURING

* Estimated, 1948
American Builder

EVEN TEMP

OIL FLOOR FURNACE

Trade Mark Registered



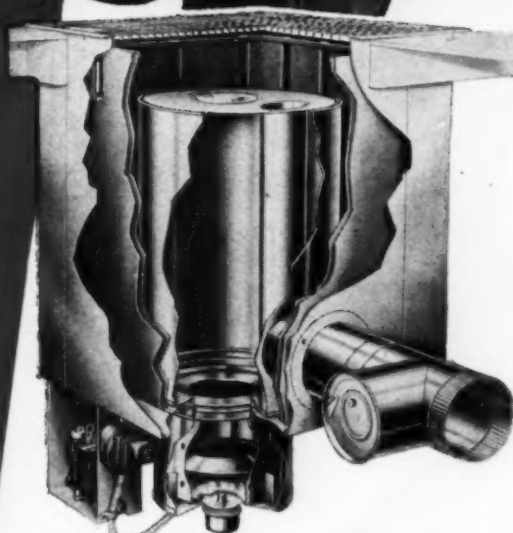
**ONLY EVEN-TEMP MEETS ALL REQUIREMENTS
OF ARCHITECTS, CONTRACTORS AND HOME
OWNERS, FOR LOW COST AUTOMATIC HEAT!**

Here is the newest, most advanced development in the popular priced automatic heating field! Because Even-Temp is a "natural" for architects, builders and home-owners in search of improved, low cost, heating equipment, dealers are assured a bigger slice of this year's anticipated volume.

Even-Temp is an amazing combination of compact efficiency, fool-proof operation, and exclusive conveniences. Compare its advantages! Even-Temp, for example, takes less floor space—only a two-foot square area! Thermostatic controls and booster fan are standard equipment. Even-Temp is a packaged heating Unit—completely wired and assembled at the factory—simpler, less expensive to install and service. And it operates quietly—carbon free—at a rated efficiency which assures substantial fuel savings!

Compare its extra conveniences, too. Instead of removing the entire grill to light or clean, just lift out a small section! Valve controls and electric switches are on one panel, accessible at floor level from inside the house. Then compare its smartly finished outer casing, double wall galvanized pressed steel inner casing, and so on!

Make this test today—order an Even-Temp Floor Furnace from the distributor in your locality and display it in your sales room. See for yourself how enthusiastically customers react to it! Write today!



Even-Temp Floor Furnaces are of course listed by Underwriters' Laboratories, Inc., and meet as well, the requirements of Commercial Standard CS-113-44 of the U.S. Department of Commerce, National Bureau of Standards.

Made and guaranteed by

NORTHWEST METAL PRODUCTS, INC.

55A SPOKANE STREET

SEATTLE 4, WASH.

NEW LITERATURE

Use the Coupon on Page 121

Attic Fan Installation Manual.....234

A 1948 installation manual for attic fans contains eight pages with cover. The principles of attic ventilation, results obtained from attic ventilation, and installation data are followed by illustrations of various methods of discharging air from the attic. Suction box and grille construction are illustrated and details are given.

Tables cover grille sizes, louver area, and areas of triangular louvers of various pitches.

The Murray Company, 3200 Canton Ave., Dallas 1, Texas.

Truck Operators Handbook.....235

Designed to provide a printed means by which truck operators can reduce operating costs and thus increase profits by proper selection and maintenance of tires, a new Truck Operators' Handbook has just been published.

Featured in the volume is a discussion of the factors which can be controlled to get the most service out of any truck tire, which points out that either too

much or too little air pressure decreases tire service. Suggestions for control of proper air pressures are given.

Overloading and improper load distribution, together with an easy formula for analyzing loads is also a prominent part of the publication, as well as a discussion on speeds and their effects on tire life. Matching and spacing of duals and mechanical irregularities which may cause rapid or uneven tread wear are comprehensively outlined.

The volume points out that periodic inspection prevents many tire failures, and illustrates and describes all of the most important causes of failure as well as telling how to prevent and repair many tire injuries. Ninety-three factors which affect truck tire life are listed, and data given on each type of truck tire the company manufactures.—The B. F. Goodrich Company, Akron, Ohio.

Guide for Welded Construction.....236

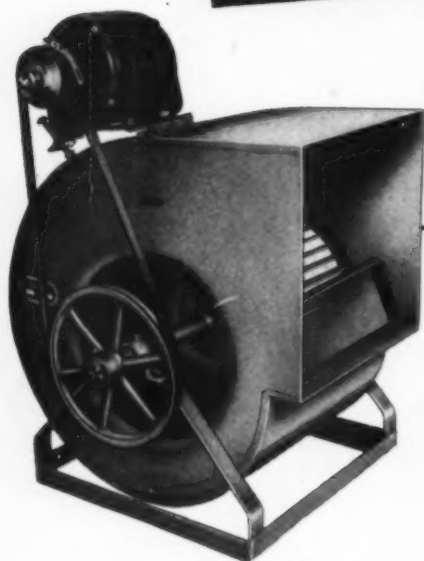
Catalog pages entitled "Designer's Guide for Welded Construction" are available and contain data from Procedure Handbook of Arc Welding Design and Practice.

Arc welding symbols as standardized by the American Welding Society are given in the order of their maximum use. Included are specification tables on the different types of electrodes and additional suggestions for planning better welded designs.

The Lincoln Electric Company, 12818 Coit Road, Cleveland 1, Ohio.

Brundage

gives you all 4 for your Blower Needs



DESIGN

Brundage Blowers are extremely quiet, yet highly efficient maintaining static pressure well above most requirements.



MATERIALS

In spite of shortages and high prices, Brundage continues to use only the highest grade materials and equipment. All motors furnished on Brundage Blowers are of nationally known make.



WORKMANSHIP

Brundage craftsmen still respect a job well done. Working with efficient, accurate tools, they produce a well-finished, sturdily built blower that you can rely on for uniformly good performance.



PRICE

Brundage is known throughout the industry for maintaining quality and at the same time holding prices to the lowest possible level. This Brundage policy helps you produce a high-quality product at a sensible price... a price that means more sales for you these price conscious days.

To get all four of the things you want... quiet, efficient design, finest materials, excellent workmanship and sensible prices... specify Brundage Blowers.

THE
Brundage
COMPANY

Blower Specialists
Since 1919

508 NORTH PARK STREET
KALAMAZOO 11, MICHIGAN

**YOU DON'T HAVE
TO HAVE A
BASEMENT**



New Century Lo-Hiboy is Adaptable for Utility Room or Basement Installation.

**YOU DON'T HAVE
TO RAISE THE
ROOF**

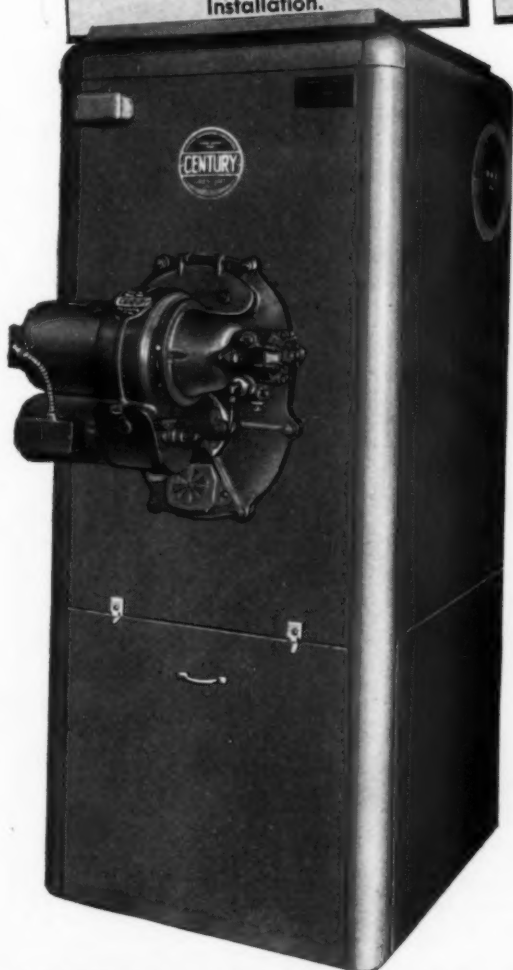


New Century Lo-Hiboy Fits Nicely in Utility Rooms or Basements with Very Low Ceilings.

**... NOR TEAR
YOUR HOME
APART**



Moves Easily Through Standard 30" Doorway — Completely Assembled at the Factory.



**YOU'LL SELL MORE BECAUSE YOU'LL
HAVE MORE TO SELL IN THE AMAZING**

NEW CENTURY LO-HIBOY FURNACE

**The ONLY Oil Furnace with
CRESCENT SUPER HEATER**

Ready now . . . and only Century has it! The remarkable new LO-HIBOY Oil Furnace with the features dealers want and need for increased sales now! Takes less time and work to install because it's shipped completely assembled (except for burner and controls); narrow enough to pass through standard doorway. Greater fuel economy . . . laboratory tests show an efficiency rating of 81%! Write today — get the facts about this new Century LO-HIBOY . . . inquire about a Century franchise in your territory. Century Engineering Corporation, Cedar Rapids, Iowa.

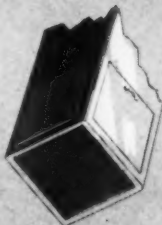
Century

ENGINEERING CORPORATION
CEDAR RAPIDS, IOWA



FAMOUS CRESCENT SUPER-HEATER

No corners or "dead" spots to impair heating efficiency. Hot gases are forced to travel long distances before entering flue, thus extracting maximum heat from fuel consumed and reducing amount of oil used.



COLD AIR RETURN EITHER SIDE OR BOTTOM

. . . saves installation and ductwork costs. Regardless of where heating unit must be located, the LO-HIBOY fits the need. Thus, the LO-HIBOY is easier to install . . . and in many cases, makes possible considerable savings.



NO MORE "PIECE-BY-PIECE" INSTALLATION

New LO-HIBOY shipped from factory completely assembled. Low and narrow enough to go through standard doorway. Installations are easier, faster . . . dealer saves time, labor . . . customer saves on installation.

OIL BURNERS • BOILER BURNER UNITS • WARM AIR FURNACES • HUMIDIFIERS • WATER HEATERS • AIR CONDITIONING

NEW LITERATURE

Use the Coupon on Page 121

Die-Less Duplicating237

A new edition of the 40-page Di-Acro catalog contains illustrations and specifications of all Di-Acro precision machines now available in six different types and a total of eighteen different sizes.

New Di-Acro machines announced during the past months have greatly increased the scope of "Die-Less Duplicating."

O'Neil-Irwin Manufacturing Company, Lake City, Minn.

Insulation Booklet238

Home Insulation Technical Booklet (12 pages) for architects, builders, engineers, contains over 40 illustrations, charts, tables; gives concise technical exposition of general principles of home insulation, including: radiant heat loss, air stratification and drafts, variable exposures, coolness balance, Radiant Coolness; how correct design avoids trouble with heat lag and condensation through the use of air spaces in walls, ventilation in attics and floors, vapor sealing.

Other features are tabulation of percentages of heat loss stopped in various assembled structures through

blanket insulation in each of three regular thicknesses; typical architectural specifications. — *Kimberly-Clark Corporation, Neenah, Wisconsin.*

AGA Research Bulletins239

Research Bulletin 46—Research in Design Methods of Preventing Closure of Gas Pilot Burner Primary Air Openings by Dust and Lint (Project DGR-3-B)—discusses the effects of variations in size and position of primary air openings, burner tube diameter, shields and other protective devices on properties of blue flame pilot burners for resisting stoppage due to dust and lint suspended in the atmosphere.

Galvanic Corrosion of Dissimilar Metals as Applied to Gas Water Storage Heaters (Project DGR-3-WH) has been prepared by Dr. Robert C. Weast of Case Institute of Technology. The work at Case is a serious attack on the conditions which cause tank failure by corrosion from stray electric currents. The magnitude of this problem can be appreciated when one considers that it is estimated that more than 10,000 tanks have to be replaced each week because of failure from galvanic corrosion.

Five possible methods of preventing galvanic corrosion of water heater tanks are indicated. Ten factors resulting from the initial work are summarized and four conclusions are reached.

Both Bulletins are available.—*American Gas Association, 420 Lexington Avenue, New York 17.*

Extra Profits In Blower Installations

with

Vent-Air

General Purpose
CAST ALUMINUM

UTILITY BLOWERS

V-5—6" (less motor) - - - \$19.00 Net

V-10—7" (less motor) - - - 24.00 Net

V-20—9" (less motor) - - - 36.00 Net

SIZE	INLET	OUTLET	WHEEL DIA.	CFM	REC RPM	REC HP
V-5	6"	6"	6 1/4"	550	1750	1/4
V-10	7"	7"	7 1/4"	1180	1750	1/2
V-20	9"	9"	9 1/4"	2280	1750	3/4 or 1

Blowers are of light weight, sturdy, cast aluminum—non-sparking. Standard diameter inlet and outlet—fit stock size pipe. Adjustable base—fits any standard motor. Adjustable discharge—rotates to four positions. Wheel statically balanced.

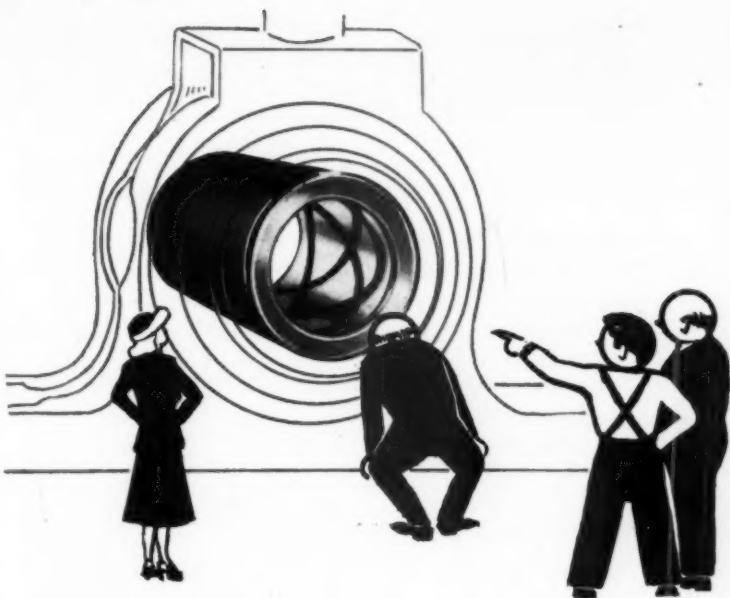
We Can Supply Motors for Each Unit, If Desired



Installed with used or new motors—VENT-AIR provides a compact, efficient blower set that permits you to make a good profit for your time and trouble. Order a VENT-AIR today. Send purchase order or cash. Shipped F.O.B. Detroit.

Fried Air-Kool Co.
8205 LYNDON
DETROIT 21, MICH.

MAXIMUM AIR DELIVERY • MINIMUM OVERALL SIZE AND WEIGHT



Anyone can see how Randall Bearings make your job a better buy

Most of your prospects don't know a blower from a thermostat . . . but they all want to know why *your* equipment will deliver better service.

That's why the easy-to-understand story of *double-lubricated* Randall Pillow Blocks helps you sell the job. Anyone who ever squirted graphite powder into a lock or oiled a sewing machine quickly understands how *double* oil-graphite lubrication . . . exclusive with Randall . . . keeps shafts running smoother and quieter for the life of the equip-

ment.

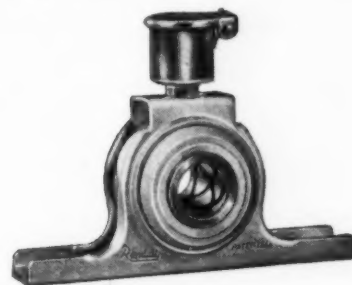
Show your prospect a Randall Pillow Block. Point out the graphite-filled grooves in the precision-machined, phosphor bronze bushing. Tell how oil feeds through the graphite to the bearing surface . . . *double* lubrication that gives extra protection and reduces friction almost to zero.

Both shafts and *sales* go smoother with Randalls. That's why it pays to standardize on *double-lubricated* Randalls and make their quiet dependability part of your selling story.

Randall quality costs no more. Write for complete data on Randall's exclusive *double-lubricated* design and the Randall line. Ask for Catalog 47.

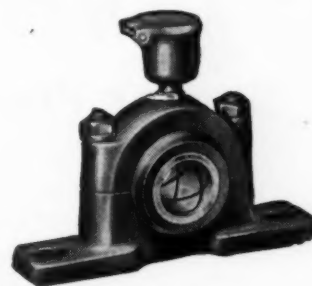
RANDALL GRAPHITE BEARINGS, Inc.
Dept. 411, 609 West Lake Street, Chicago 6, Illinois

Select the *right* pillow block . . . not too heavy, not too light . . . from the complete Randall line. Every Randall is *double-lubricated*, self-lubricating, self-aligning, easy to install, keeps shafts running quieter . . . smoother . . . longer. Here are two of the many Randall models.



**Streamlined One-Piece
Steel Housing . . .**

maximum strength, minimum air resistance. Mounts in any position. Single or double oil reservoir.



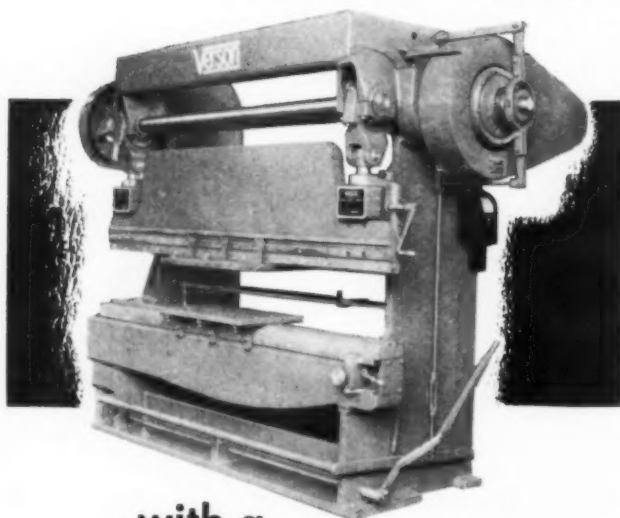
Standard . . .

general service pillow block. Single oil reservoir.

Representatives carrying stocks

The Berry Bearing Company
Chicago 16
Ed. W. Maltby Company
Los Angeles 15, San Diego,
Phoenix, Honolulu
C. W. Marwedel
San Francisco, Oakland
Moffatt Bearings Company
Philadelphia 30, Baltimore,
Richmond, Charlotte, Atlanta
Tek Bearing Company
Albany, Boston, Bridgeport,
Newark, New York, Providence
Salt Lake Hardware Company
Salt Lake City 9

SPEED up your
sheet metal work
economically



with a

TRADE **Verson** MARK

Junior Press Brake

On a variety of sheet metal jobs Verson Junior Press Brakes will lower your unit forming costs by speeding production. These compact brakes produce the same quality of work you expect from a large, expensive brake — at small machine economy. Simplicity of adjustments — without the use of tools — reduces set-up time to the minimum. Two plate construction permits use of standard notching, coping and multiple punching dies. Whatever your requirements, there's a moderately priced Verson Junior Press Brake sized for your needs. Complete line of large Verson Press Brakes, Hydraulic and Mechanical Presses also available. For special problems, call in a Verson engineer.

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Originators and pioneer builders of Allsteel Welded Presses

POWER PRESSES • CLUTCHES • FORGING PRESSES
DIE CUSHIONS • HYDRAULIC PRESSES • PRESS BRAKES

NEW LITERATURE

Use the Coupon on Page 121

Refrigeration Valves.....240

A 20-page condensed catalog, describing the line of AP refrigeration valves, has just been published.

Thirty-five photos and drawings illustrate features of AP expansion valves, AP water and pressure regulating valves, AP solenoids, AP Trapdri's and Trapit's. Engineering specifications are included.

Automatic Products Company, 2540 N. 32nd St., Milwaukee 10, Wisconsin.

Aluminum Sheet and Plate.....241

The Aluminum Sheet and Plate Booklet, containing 48 pages (6 x 9 in.) of technical information relative to various sheet and plate alloys, gauges and sizes, was prepared to meet the steadily increasing demand for more information on aluminum sheet and plate and how to use it effectively. It is designed to meet the needs of the experienced user of aluminum as well as to give the newcomer a much clearer insight into the advantages which aluminum has to offer.

Beginning with a brief discussion of cost factors, the booklet goes into a careful comparative analysis of costs of aluminum sheet and plate, with a short outline of the advantages of using coiled or flat sheet.

From the section on cost factors, the booklet proceeds into short summaries of such topics as formability, weldability, riveting and joining, brazing, soldering, machinability, and resistance to chemical attack with a short discussion of the alloys most suitable. Also given is a short explanation of heat-treatable and non-heat-treatable alloys. Finishes for aluminum sheet and plate, characteristics of the metal, and the problem of avoiding distortion are likewise summarized briefly.

A series of sections in the booklet are devoted to such topics as definitions, identification, packing, commercial sizes. Other sections present tabular information on such topics as the specified chemical compositions, specified mechanical properties, typical mechanical properties, commercial tolerances, and bend radii.

A large section contains tables for computing accurately the weight of various sizes and thicknesses of sheet and plate items. Also listed in the weight tables are figures for calculating the weights of a variety of sizes and thicknesses of aluminum circles. From these tables, the user is able to calculate closely the exact quantities his application will require. Also shown is a simple formula for comparing the weights of aluminum with the weights for other metals. Still other sections list a comparison of gauges and decimal equivalents of aluminum sheet and plate gauges.

One of the final sections of the booklet gives an index of specifications for aluminum sheet and plate as listed by the various government bureaus and a number of the nation's leading professional societies.

Reynolds Metals Company, Aluminum Division, Desk 105, 2500 So. Third Street, Louisville 1, Kentucky.

BARD THE COMPLETE HEATING LINE

65,000 to 400,000 BTU – OIL
90,000 to 240,000 BTU – GAS

Bard's COMPLETE range of capacities provides you with greater opportunity for competitive selling with more profit and greater satisfaction to the customer.



OIL SERIES

TO 400,000 BTU/HR. OUTPUT AT BONNET

Bard's smaller oil furnaces are equally suited to basement or utility room installation. Unless otherwise specified, units are shipped complete with all controls for your convenience. Many thousand Bard units sold through "recommendation" prove Bard's superior quality. Write Bard for delivery information on your furnace requirements.



GAS SERIES

BARD FEATURES THAT YOU WILL APPRECIATE

- Electric welded, large area prime heating surfaces.
- Safe, approved controls for economical, automatic operation.
- Quiet, low velocity, large volume air circulation.
- Oversize dust filters of easily replaced standard sizes.
- High efficiency burners for maximum fuel economy.
- Completely automatic. Heats. Filters. Humidifies. Circulates.
- Beautifully finished duotone cabinets in furniture-finish enameles.

TO 240,000 BTU/HR. INPUT

Bard's gas heating units provide economy of operation beyond expectations. The simple, clean design of large prime heating surfaces provides longer travel for hot gases, extracts more usable heat. (Customer's fuel bills prove this). Every Bard gas unit is carefully tested and inspected, and shipped with all controls, ready for installation. Bard furnaces are designed by experienced "furnace men" who respect installation problems.

Never before have Bard engineers packed such high efficiency and great capacity into such compact heating systems. By all means write for catalog and prices today so you can do more business more profitably in 1948.



BARD MFG. CO., BRYAN, OHIO

Please rush complete catalog and prices on oil and gas units.

NAME.....
 ADDRESS.....
 CITY.....STATE.....

Chicago Office: 1157 Merchandise Mart, Chicago 54, Illinois

A Complete Line in Many Capacities for Profit-Wise Dealers



Designed and Built by BARD MANUFACTURING CO. — BRYAN, OHIO

Jobs like this are right down your alley if you're working with U·S·S Stainless

RESTAURANT EQUIPMENT of U.S.S. Stainless Steel is easy to make. Easy to sell, too, because it helps the restaurant make more money. People everywhere identify "stainless" with "cleanliness" ... and cleanliness attracts customers, whets their appetites.



A REMODELED building entrance. Note the pleasing simplicity which springs from the simple beauty of U.S.S. Stainless Steel sheets. In every city hundreds of buildings could use this inexpensive prescription for attracting new tenants and holding old ones.



SEE HOW this smart New York bakery is making a lot out of a small location with an inviting easy-to-fabricate front of U.S.S. Stainless Steel. Do you know any bakeries in your locality who could use a front like this? Just show them this photograph!



EVEN UNPRETENTIOUS homes are excellent prospects for drainboards, sideboards and sinks of U.S.S. Stainless Steel. Women like them because they never tarnish and are so easy to clean. Stainless steel is the only metal which is immune to all food corrosion, will never turn black!



• More Stainless Steel is being used today than ever before. Today it's easy to go out and get *extra profitable* jobs with U·S·S Stainless because people want and are willing to pay for what Stainless Steel has to offer.

Nearly every home is a prospect for a stainless kitchen. Hotels, restaurants, clubs, and hospitals everywhere are equipped with this modern, useful metal. Marquees, store fronts, display counters and building entrances are profitable applications for this permanently attractive construction. In factories and industrial plants, stainless steel applications are increasingly in demand. Why not build with U·S·S Stainless and cash in on this popular preference?

What's more, you can get U·S·S Stainless Steel

—in sheets of No. 2B and No. 4 finish; in bars that meet high standards of machinability; plates in a wide range of sizes; welded and seamless tubing; pipes, angles, channels, as well as welding electrodes in all standard grades and specifications.

To make sure of getting what you want quickly—phone, wire, or write one of the warehouses of United States Steel Supply Company. You'll find one in your city or not far away.



U·S·S STAINLESS STEEL

SHEETS · STRIP · PLATES · BARS · BILLETS · PIPE · TUBES · WIRE · SPECIAL SECTIONS

UNITED STATES STEEL

AMERICAN STEEL & WIRE COMPANY, Cleveland, Chicago & New York
CARNEGIE-ILLINOIS STEEL CORPORATION, Pittsburgh & Chicago · COLUMBIA STEEL COMPANY, San Francisco

NATIONAL TUBE COMPANY, Pittsburgh · TENNESSEE COAL, IRON & RAILROAD COMPANY, Birmingham

UNITED STATES STEEL SUPPLY COMPANY, Warehouse Distributors—Coast to coast · UNITED STATES STEEL EXPORT COMPANY, New York

NEW LITERATURE

Use the Coupon on Page 121

Health of Arc Welders.....242

Public Health Bulletin No. 298 is entitled "Health of Arc Welders in Steel Ship Construction." (Price 55 cents) The Bulletin reports a study of the health of shipyard welders which was made by the Industrial Hygiene Division, U. S. Public Health Service in co-operation with the U. S. Maritime Commission and the U. S. Navy in Maritime Commission and Navy-contract shipyards.

Hazards to the health of arc welders is negligible when adequate ventilation is provided to control the toxic fumes released.

Superintendent of Documents, Government Printing Office, Washington 25, D. C.

Registers and Grilles.....243

Catalog No. 48—Registers and Grilles—contains 32 pages and cover with a Table of Contents. Three distinct types of register face and grille construction are shown. There are faces, floor registers, pipeless furnace gratings, baseboard registers with flexible grille bars and removable grilles, ceiling ventilators, setting frames, air conditioning registers, wall grilles and baseboard intakes, grilles with deflecting vanes, foundation ventilators, no-vision grilles, ceiling outlets, deflecting cones, back pressure dampers, and perforated grilles.

The Independent Register Co., 3747 East 93rd Street, Cleveland 5, Ohio.

Booklet B-3804.....244

An eight-page color booklet describing the economic and versatile performance of the new line of Axiflo fans suitable for high temperature applications has been released.

Especially significant is the low resistance cone housing that keeps the motor, belts, and all bearings out of the air stream.

Complete with pictures of the various models available in either the elbow or straight-through type, the booklet describes how the cone arrangement and other features including low maintenance and ease of installation make these positive pressure fans suitable for such applications as air conditioning systems, heating and ventilating, dust and fume removal, equipment and machinery cooling, heat treating non-ferrous metals, and industrial drying and processing.

To provide a wider range of operating conditions, Axiflo fans are available with either three-bladed aluminum alloy or eight-bladed welded steel fan wheels. Characteristics and special advantages of each are listed.

Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa.

AMERICAN ARTISAN, April, 1948



Of course the oil man didn't intentionally track mud all over her clean floor. But he can't help it if he has to tramp through the house and down cellar stairs to check the oil gauge.

There is a way to eliminate this tramping and tracking through the home. The answer is VENTALARM Tank Fill Signal!

On your burner service calls, tell the housewife about VENTALARM Whistling Fill Signal. Just let her know how it provides for completely automatic fuel delivery — how it assures uninterrupted privacy — oil delivery even when she's not home. Like as not she'll want VENTALARM Signal installed right away.

And you can install it while you are there on the service call. An additional sale and extra profit!



With VENTALARM Signal driver need never enter the home.

VENTALARM
Model LC
for existing
installations



AVAILABLE AT YOUR FAVORITE SUPPLY HOUSE.
Write us for special customer mailing folders.



Canadian Licensee — EMPIRE BRASS MFG. CO., LIMITED, London, Ontario

FOR

*Quality Products
Prompt Service
Profitable Cooperation*

Buy from a Herman Nelson Distributor like Inland Supply Company of Chicago.



L. J. Peterson,
General Sales Manager,
Inland Supply Company

THE partnership between Herman Nelson and its carefully selected Distributors like Inland Supply Company assures you prompt delivery of quality products as well as profitable merchandising cooperation.

Herman Nelson heating and ventilating products have produced superior results since 1906. Literature and sales promotion campaigns provided by The Herman Nelson Corporation have brought about many profitable sales for dealers and contractors throughout the country.

Herman Nelson Distributors meet your requirements promptly from stock for both equipment and installation materials. Members of their sales and engineering departments are available for immediate service.

Contact the nearest Herman Nelson Distributor when you need prompt delivery of quality heating and ventilating equipment.



THE HERMAN NELSON CORPORATION

Since 1906 Manufacturers of Quality Heating and Ventilating Products
MOLINE, ILLINOIS

WITH THE MANUFACTURERS

THE ARMSTRONG COMPANY of Detroit, Michigan, manufacturers of Tharco Furnace Cement, announces the appointment of Mr. C. D. Frobes as Vice President and General Manager. He has been serving as a director of the company for a number of years.



C. D. Frobes

Mr. Frobes is a graduate of the Colorado School of Mines and is a metallurgical engineer. For the past twelve years he has served as production manager for Edgar Brothers Company of Metuchen, New Jersey, and has been in charge of its clay mining operations in Georgia.

Mr. Frobes will be located at the company's offices at 241 South Post Avenue, Detroit, Michigan.

CHARLES R. BENNETT is opening a jobbing business in furnaces, fittings, accessories, in the Chicago area at 1217 North Oakley Boulevard, Chicago, Illinois under the name of Armstrong Heating Supply Company.

Bennett's 25 years of heating experience in his own retail business and in executive positions with large merchandisers should be of real benefit and profit to dealers purchasing from this new jobbing house. A complete stock will be carried.

ALEXANDER MARTIN has been appointed manager of the central district of the Sturtevant Division of Westinghouse Electric Corporation, with offices in Pittsburgh, Pa. He replaces Harold C. Hickock who has resigned.

In this position, the new manager will direct the sale of air handling equipment for all types of industrial plants and processes, including air conditioning, heating and ventilating, and forced and induced draft fans for power plants.

Mr. Martin has been with Sturtevant since 1925, as chief craftsman, later manager of the Newark Office and, since 1942, as manager of the industrial sales department at division headquarters in Hyde Park, Mass.

A native of New England, Mr. Martin is a member of the American Society of Heating & Ventilating Engineers, and the American Society of Mechanical Engineers.

HOWARD C. SHILLING has been appointed district manager of the Goshen, Indiana, territory according to an announcement by Penn Electric Switch Co., manufacturer of automatic controls for heating, refrigeration, pumps and air compressors.

Shilling, an experienced sales engineer in the application of automatic controls, joined the Penn sales organization approximately 7 years ago. He covered the Chicago territory and later was manager of the company's Moline office until his recent appointment.

Fit to Carry On A 28 Year Tradition of

LEADERSHIP...



7.5 to 18 Gallons
Per Hour Capacity

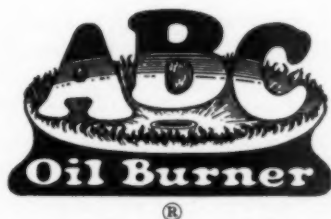


*The **NEW**
ABC Model 53
Oil Burner*

Built to meet the demand for a *larger* capacity oil burner, the ABC Model 53 is precision-engineered throughout to perform in the same dependable, efficient, trouble-free manner as the hundreds of thousands of ABC oil burners now in service throughout the world. A *new* burner, it is fully equipped to carry on the enviable 28 year old ABC reputation for finest quality heating equipment... your guarantee of a satisfactory, *profitable* installation every time! Write for full information.



You Will Like These New Built-In Features:

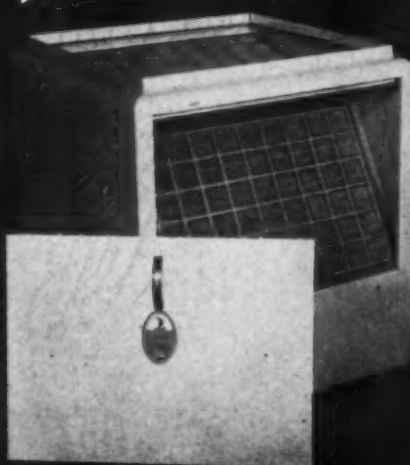


- 7.5 to 18 Gallons Per Hour Capacity
- Twin Transformers for Dual Ignition
- 2-Stage Webster Fuel Unit
- Built-In Electronic Combustion Safety Control
- No Mounting of Controls on Stack
- Hinged Transformers

AUTOMATIC BURNER CORPORATION

1823 CARROLL AVENUE • CHICAGO 12, ILLINOIS

**Be A
Blower Dealer**



Convert any gravity furnace into a modern forced-air heating plant with the Viking Blower Package. Engineered for quick, easy installation... quick, certain profits for you.

ANOTHER **Viking** PROFIT BUILDER

SERIES 1100 HUMIDIFIER
FOR FORCED AIR
HEATING SYSTEMS



A companion package that makes your conversion job a complete WINTER AIR CONDITIONING SYSTEM. Designed to fit all types of furnaces. Complete data in Bulletin 349.



Viking No. 11 KIT

AUTOMATIC WATER
PAN FILLER FOR USE
ON ANY FURNACE

A complete package. Carry one at all times. Quickly, easily installed. Helps make an inspection trip a profitable call.

Viking

AIR CONDITIONING CORP. 5600 WALWORTH AVE.
CLEVELAND 2, OHIO

WITH THE MANUFACTURERS

ALFRED C. BAECHLIN, 2033 N. Fortieth Street, Phoenix, Arizona is now a representative of Illinois Testing Laboratories, Inc., 420 N. La Salle Street, Chicago. Mr. Baechlin will handle the complete line of Alnor scientific measuring instruments on an exclusive basis in Phoenix.

REX CLAY PRODUCTS Co., Detroit, Michigan has announced their association with the LaClede-Christy Clay Products Co. as exclusive representatives in the Detroit territory. Their stock of refractories and specialties will be enlarged and they will offer refractories from Missouri as well as from Pennsylvania.

FRED C. FARMER has been named general sales manager of the Holly Manufacturing Company, Pasadena, California, makers of Stubby vented floor furnaces and Holly vented wall heaters.

For eight years previous to his new appointment, Farmer was with Bowser, Incorporated, where he served as manager and as sales manager of the oil meter division. Prior to that time he was one of the owners of American Liquid Meter Company of Alhambra, California who pioneered the development of the Bassler liquid meter.

ALLIED BUILDING CREDITS, INC. has assigned A. W. Clapp, vice-president, as special representative in charge of Eastern operations. With headquarters in St. Paul, Mr. Clapp, who is a senior officer and director of the company, will have direct supervision over all activities of the company in the Middle Western and Eastern states.



A. W. Clapp

Allied is the largest finance company specializing in light construction mortgages and installment notes exclusively. The company works exclusively with dealers and contractors in the building industry.

Mr. Clapp, who is also in complete charge of business development for the company, has been with Allied Building Credits for ten years, joining it shortly after it was organized as part of the Weyerhaeuser Timber Company.

THE DEMUTH Co., 509 Fifth Ave., New York City, has been organized to represent manufacturers of heating and ventilating equipment in the New York area. They will represent William S. Haines Co., Philadelphia; Tenney Engr. Co., Newark, and American Foundry & Furnace Co., Bloomington, Ill.

JOSEPH T. RYERSON & SON, INC., distributors of steel from stock, have announced the appointment of Alfred J. Olson as an assistant sales manager of their Chicago plant. He succeeds Ray C. Page, who was recently named sales manager of the company's new steel service plant under construction in the San Francisco area.



A. J. Olson

Mr. Olson became a member of the Ryerson organization in 1923. He progressed through various divisions of the company; advertising, claim, work order and inside sales, until his appointment in 1936 as sales representative in Illinois. For the past 11 years he has made his home in Peoria, Illinois. Mr. Olson's headquarters will be in Chicago.

SURFACE COMBUSTION CORPORATION has announced the opening of its new Dayton, Ohio headquarters at 238 Lafayette Street.

Mr. Fred S. Hamer, formerly of the Sales Engineering Department in the Columbus plant of the company will be in charge of the new offices as district sales manager of the Space Heating Division.

Mr. Richard B. Thornburgh, former resident of Dayton and Janitrol district sales manager there, has been transferred to Columbus to take over the district managership of the Columbus sales territory.

TWO NEW APPOINTMENTS were announced recently by Burton L. Wolff, vice-president of Benjamin Wolff and Company, Chicago metals warehouse concern. Jack B. May, Chicago district sales manager was elevated to the position of general manager of sales. Walter M. Carlsen was named to succeed Mr. May.

A. J. HORN is now sales promotion and advertising manager of Payne Furnace Company. Horn succeeds the late Ralph V. Hiatt, for over 20 years "Payneheat" advertising manager, who died recently following a brief illness.

"Art" Horn joined Payne in 1945 as Director of Research and later became manager of the company's Long Beach retail branch.

His technical education was received at Iowa State College, majoring in industrial science, and at Northwestern University where he studied business administration and advertising.

NEW, DISTRICT WAREHOUSES have been opened in New York and Chicago by the Farr Company, 2615 Southwest Drive, Los Angeles, California manufacturers of "Far-Air" Filters. Chicago warehouse facilities are enlarged to better serve the growing air filtration demands of the middle west. The New York warehouse has been recently added to the present sales offices to provide faster distribution service to East coast points. Both the Chicago and New York offices are continuing under the same management.

MANUFACTURERS!

Viking

EFFICIENCY



Viking Dependable Humidifiers
Add Winter Air Conditioning
to Your Furnace



Write Today for
Viking
BLOWER CATALOG


Contains complete specifications on blower units for any size furnace at any capacity.

Puts Quality
in Your Furnace


Viking Blower assemblies are recognized by the entire industry as the most efficient, trouble-free unit ever developed. And, the complete unit costs less than one you, as a furnace manufacturer, could build or assemble yourself.

SERIES 1300
FOR POPULAR
SIZED FURNACES

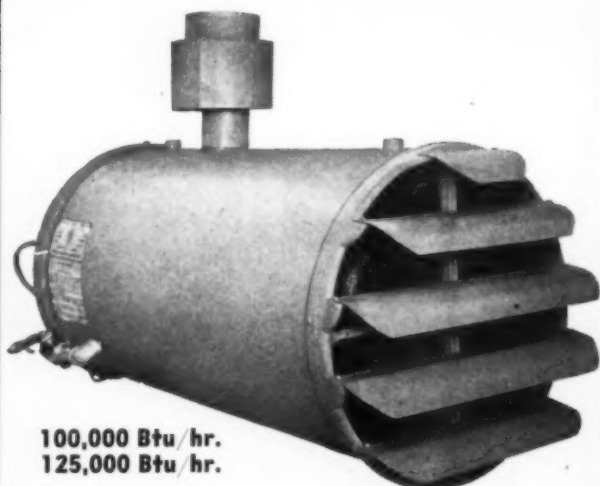
A complete float operated humidifier especially designed for small plenum installations. Incorporates the famous Viking Top Seat float valve for longer, trouble-free service under all conditions. Bulletin 349 contains complete data.



Viking



AIR CONDITIONING CORP. 5600 WALWORTH AVE.
CLEVELAND 2, OHIO



100,000 Btu/hr.
125,000 Btu/hr.

It's New! *It's Amazing!* **This John Zink UNIT HEATER**

This new and unique design in suspended space heaters features: More Head Room—Compact design—More Heat from gas burned, gas company test shows overall efficiency of 82%.

Where floor space is at a premium this turbine type unit has greater heating capacity. Controls are built-in. Unit is shipped completely assembled ready for installation. One unit will heat a 40' x 80' space. It is A. G. A. approved for liquefied petroleum gases, manufactured or natural gas.

- Finished in Toast Tan Crinkle Enamel Baked On
- Adjustable Louvers

— Write for Literature —

John Zink Company

4401 South Peoria

TULSA, OKLAHOMA

New York - Salt Lake City - Houston - Los Angeles

WITH THE MANUFACTURERS

JOHN MCGOWAN OF AIEA, OAHU, T.H., traveled many thousands of miles to attend the 60th anniversary sales convention recently held in Cleveland, Ohio, by Perfection Stove Company.



McGowan, who works out of Perfection's Oakland, Cal., sales district, is one of 125 of the company's sales representatives who attended the five-day meeting to hear the company's plans for 1948.

At the convention, Perfection Stove Company announced its entry into the gas appliance field. Gas ranges and water heaters will be marketed, along with the company's long-established line of cooking and heating appliances using oil as fuel, within the next few months.

Pictured above are three of Perfection's officers as they welcomed Mr. McGowan to Cleveland. Left to right are F. A. Gabriel, sales manager, Stove and Heater Division; Mr. McGowan; C. H. Foulds, general sales manager; and Marc Resek, chief engineer.

MORLENMAC SUPPLY COMPANY, 5408 Bragg Road, Cleveland, is a new firm that has been organized by Leonard Fromson, Morris Fenberg and Mac Gilbert. The firm will be wholesale distributors of warm air heating, winter air conditioning, sheet metal and roofing supplies.

J. A. FLETCHER has joined Wayne Home Equipment Company, Inc., Fort Wayne, Indiana, in charge of sales of the Heating Equipment Division.

Mr. Fletcher is a University of Illinois graduate, and has been associated with the Kalamazoo Stove and Furnace Company. He was most recently in the heating and plumbing business at Auburn, Indiana.

PAUL R. JETT of Kirkwood, Missouri has been appointed sales representative of Air Controls, Inc., fan and blower manufacturers of Cleveland, Ohio for the territory covering southern Illinois and the state of Missouri.

Mr. Jett was formerly with the Minneapolis-Honeywell Regulator Company and has wide experience in both the retail and wholesale field.

ROLLED STEEL ANGLE RINGS



Also Channels • Tees • Bars • Rounds
and Shapes Rolled To Any Radius
To Your Specifications



Take the work out of sheet metal pipe assembly and get a better, tighter job with Chicago Metal Rolled Steel Angle Rings. They are ROLLED RITE assuring accuracy in all dimensions, uniformity in curvature, eliminating all distortion. The smooth face on each ring makes for a tight joint. A big time and effort saver on exhaust, fume disposal, dust-collecting, and ventilating installations.

Write for list of sizes and net price list.

Also Sheet Metal and Heating Supplies

Moncrief Furnaces
International 85 - 150
Oil Furnaces
Oil Burners - Tanks
Blowers - Humidifiers
Western Turbine Ventilators
Accurate Ventilators
Controls - Minneapolis
Conductor Elbows
Hangers - Hooks - etc.
Sheet Copper
Blow Pipe Ells - Blast Gates

Complete Catalog and Net Price Sheet
on Request.

CHICAGO METAL MFG. CO.

3733 S. ROCKWELL STREET, CHICAGO 32, ILLINOIS



*America's
Favorite*
REGISTERS

IT'S SOUND BUSINESS TO USE A FULL LINE SOURCE

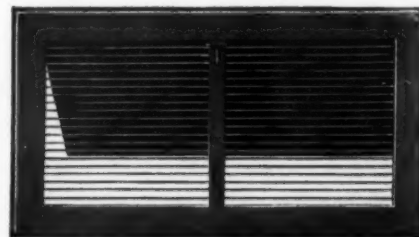
● Less bookkeeping, less freight, better Registers and Grilles, no mixed-up stocks—it's always better to select one dependable source for your Gravity and Air-Conditioning Register needs. **MAKE IT U. S.**



No. 40 SERIES Gravity Baseboard Registers

● Equally smart in today's new modern homes or for re-vamping the heating systems of old homes. Its large "free area" gives perfect results with gravity or converted-gravity forced-air systems. Removable Grille attached with patented engaging buttons. No loose screws to be lost—less installation time, cost. Will actually render real Labor Savings.

No. 153 AIR-CONDITIONING REGISTERS



● A beautifully designed register for your low price jobs—yet attractive enough for the most costly homes. Grille bars can be set for down flow to prevent wall discoloration.

SEND for latest catalog No. 47 of Gravity and Air-Conditioning Registers, and 41-F of Pipe, Fittings, Dampers, Clips and Tips.

UNITED STATES REGISTER CO.
BATTLE CREEK, MICHIGAN
MINNEAPOLIS • KANSAS CITY • ALBANY



Clean furnaces quickly— easily—thoroughly!

Check the advantages of the General Electric Furnace
and Boiler Cleaner

- The new General Electric Furnace Cleaner can do a thoroughly efficient job on any furnace.

This timesaving furnace cleaner has a powerful suction action that quickly removes soot and scale from furnace interiors. It's so fast, so efficient that you can clean many furnaces a day. That means more profits for you!

It's simply constructed, light in weight. One man can operate it with *no previous training*.

General Electric backs this machine with the company warranty, and provides all special tools and accessories. For further details, mail coupon below. General Electric Company, Bridgeport 2, Connecticut.

FAST • EFFICIENT • QUIET • ECONOMICAL

The New General Electric

Commercial Vacuum Cleaner

GENERAL ELECTRIC

A & M Department, Section 133 General Electric Company,
Bridgeport 2, Conn.

Send descriptive literature concerning

- () Wet and Dry Pickup Vacuum Cleaner
() Furnace and Boiler Cleaner

Name.....

Firm.....

Address.....

City..... State.....

WITH THE MANUFACTURERS



OSCAR C. PALMER (left foreground), president of Palmer Manufacturing Corporation, double checks the loading of five cars of Sno-Breze coolers that are bound for foreign markets.

Mr. Palmer remarked that of the increasing number of foreign orders being received by his corporation, many can be attributed to foreign industrialists who have been attracted to ever popular Arizona and have visited his plant. Many of these visitors are from areas comparable in climate to Arizona, and are not only impressed with Arizona's modern techniques in irrigation and soil cultivation, but justly consider us authorities on cooling for summer living comfort.

HERMAN NELSON CORPORATION, Moline, Illinois, has announced the following changes in its field organization:

A new branch sales office has been opened in Springfield, Mass., under the direction of Philip A. Boulton who has recently been working out of the Boston office. Frederick M. Hewitt has been transferred from Washington, D. C., to take charge of a new office in Baltimore, Md. Both offices will handle sales of the company's line of unit heaters, unit ventilators, propeller fans, unit blowers and centrifugal fans.

Richard K. Hunter & Co., Greensboro, N. C., has been appointed product application engineer covering North and South Carolina.

Appleton Engineering is now representing the firm in the Denver, Colorado, sales area. J. M. Appleton was a Herman Nelson product application engineer from 1923 to 1941. During the war he was active in ordnance engineering.

D. R. Rippey, product application engineer in Houston, Texas, has been assigned additional sales territory in the San Antonio area.

The staff of the Philadelphia branch office has been increased by the addition of W. Donald Strause as product application engineer to assist P. A. Cavanagh, manager. Now associated with Frank B. Johnston, Jr., manager of the Cleveland branch office, is W. B. Polhemus.

The Cincinnati branch office has been moved to Room 1107 Enquirer Building, 617 Vine Street, from its old location in the Temple Bar Building.

Save yourself TIME and MONEY

Order Furnace Fittings from

"Made-Rite"



INVESTIGATE MADE-RITE CONNECTING LOCK STRIP

Patent Pending

Here's a time and material saver for speedy and air tight installations of trunk line and wall stack fittings with all the "Know How" of years of experience in the manufacture of precision "Made-Rite" fittings. Write for complete details today and you will receive our prompt attention.

NO JOB can be better than the fittings you use and no fittings can be better than ours. We've always made a conscientious effort to supply the finest fittings and get them out to our customers with a minimum of time and trouble.

You'll find that dealing with us will be a pleasant and profitable experience. We have a complete line of fittings and accessories to meet your every need and we're sure you'll agree that one order will lead to many more.

Wholesale jobbing inquiries respectfully invited and will receive our usual prompt attention.

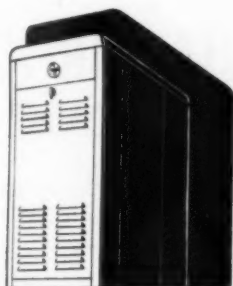


"Made-Rite" Co., Inc.

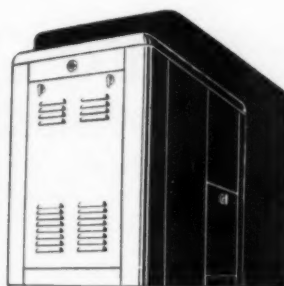
10th & Monroe St. Newport, Ky.



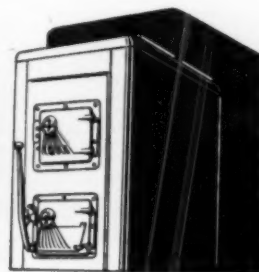
Certified gas
conversion
burner



Certified gas fired
forced air furnace

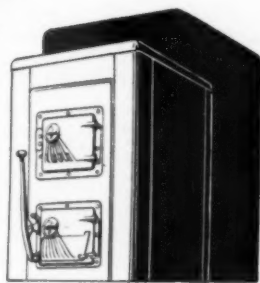


Certified oil fired
forced air furnace

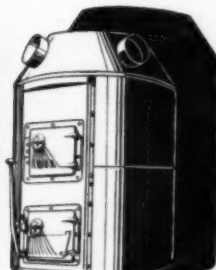


Certified coal fired
forced air furnace

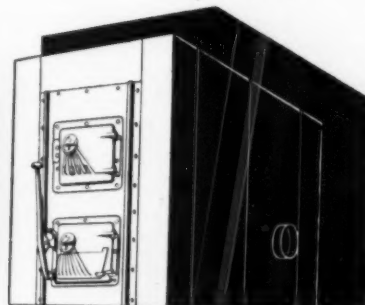
Certified
HEATING
EQUIPMENT
IS YOUR
BEST SOLUTION
TO THE RESTRICTED
FUEL PROBLEM



Certified coal fired
gravity furnace, square



Certified coal fired
gravity furnace, round



Certified coal fired
Mammoth furnace

The easy conversion of Certified Furnaces from one fuel to another helps solve today's uncertain restricted fuel problem. A Certified Furnace takes care of your customer's comfort now, and later . . . permanent satisfaction. Certified Furnaces are right . . . right for immediate use in any locality . . . right for tomorrow's changing conditions.

CERTIFIED FURNACE CO.

DIVISION OF STAINLESS & STEEL PRODUCTS COMPANY

1000 BERRY AVE.

ST. PAUL 4, MINN.

WITH THE MANUFACTURERS

THE RESEARCH PRODUCTS CORPORATION of Madison, Wisconsin, has announced the promotion of A. W. Brown to the position of assistant sales manager. Mr. Brown is well known in the industry for his work in sales supervision on Research air filters.

The company also announces the addition of Gilbert H. Piering to the sales department. Mr. Piering, who recently returned to civilian life after three and one-half years of army service, will cover the territory of Iowa, Missouri, Nebraska, Kansas, Oklahoma, and Arkansas.

The Madison firm manufactures air filters, grease filters, expanded fibre products, and water treating minerals.

G. H. STIFLER has been recently appointed sales manager of the Barth Manufacturing Co. of Milldale, Conn., manufacturers of sheet metal working machinery. Mr. Stifler was placed on U.S.N.R. inactive duty after serving from 1942 to 1946 in establishing and supervising machine and sheet metal shops for the repair of naval aircraft in this country and at advanced bases overseas. Prior to World War II, Mr. Stifler was associated with the L. A. Benson Co. of Baltimore, Maryland.

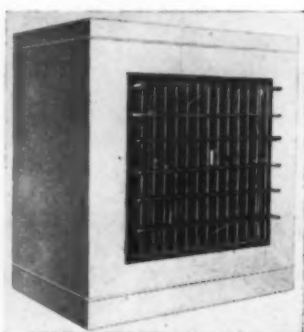
A RECENT MEETING of the Detroit Warm Air Heating and Air Conditioning Contractors Association is pictured with this item. Held at the Fort Shelby Hotel the meeting was featured by a presentation which explained the operating principles of the Thermodrive variable speed pulley in forced warm air heating systems. A new merchandising kit was presented to the



assembled members, the kit consisting of all the components and parts necessary for the conversion of existing heating plants to variable speed blower operation. Mr. B. T. Wiechers, assistant sales manager and Louis Ehrich, service manager conducted the presentation.



CHILL-AIR UTILITY PACKAGE UNITS



DE LUXE CHILL-AIR 1948 WINDOW COOLER

This remarkable cooler will establish a new Chill-Air Cooler sales record. Lowers temperature from 10 to 18 degrees • cools 1 to 3 rooms • unusually quiet operation • heavy duty, 1000 R.P.M. fan motor • recirculating pump has heavy duty, totally enclosed, moisture proof motor. Installed in few minutes • no water connections necessary. Ideal for living rooms • bedrooms • apartments of all sizes • offices • trailers, etc. Dealers sold from 100 to 1200 Chill-Air coolers in 1947.

Distributors Write. A Few Choice Territories Open.

For Homes, Apartments, Offices and all commercial installations.

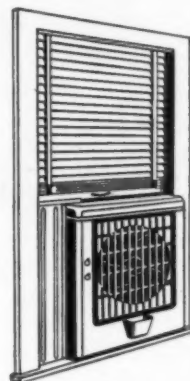
These units are compactly built in 3 sizes to meet almost every installation problem. Place over doors; suspend from ceiling; install in back rooms or wherever outside air is available. Dealers can save expensive electrical wiring and duct work costs. Chill-Air Package Units are especially designed for all outdoor installations.

All Chill-Air Units are highest in efficiency. Lowest in operating cost. Lowest in first cost.

National Engineering & Manufacturing Co.

523 Wyandotte Street

Kansas City, Missouri



DEALERS . . .

Get on the Chill-Air Band Wagon now. Write for literature, order sample units. Place your order for your season's requirements NOW! This is IMPORTANT . . . materials are critical. Chill-Air distributors in your territory will supply you.



Self-Contained Inner Unit



Air Volume Adjustment

**FAST
INSTALLATION**

*"Custom-made"
air pattern with
Kno-Draft Adjustable
Diffusers in
Champion Spark Plug Plant*



PROBLEM: A ceramic kiln radiates heat on one side and a cold window-filled wall creates drafts on the other. The space is long and narrow with low head room. The occupants work in short sleeves. Unusually large volumes of supply air have to be brought in to combat the heat of the kiln. Space for duct work above the room is limited so that diffusers have to be spaced much closer than usual. The supply air stream has to be directed slightly above the horizontal and evenly distributed so that no drafts are felt by the personnel.

SOLUTION: Kno-Draft Adjustable Air Diffusers were chosen because of their ability to control air direction, volume and throw. A "custom-made" air pattern was created which thoroughly mixed room and supply air, maintained uniform temperature throughout and eliminated drafts, hot spots, and cold spots. *Installation* was fast. Kno-Draft self-contained inner units cut installation time up to 50%. *Balancing* was fast. CFM readings were taken directly with Velometer. A twist of the wrist changes air volume on each diffuser.

Free — New handbook on Air Diffusion

It contains the latest engineering data on air diffusion and is profusely illustrated with charts, photographs, sketches and dimension prints that simplify the selection, application, location, assembly, erection, testing and adjusting of Kno-Draft Adjustable Air Diffusers. It is designed to help you get top efficiency from an air conditioning system by creating "custom-made" air distribution patterns.

For your FREE copy, please write Dept. J-10



W. B. CONNOR ENGINEERING CORP.

Air Diffusion • Air Purification • Air Recovery

112 East 32nd Street



New York 16, N.Y.

IN CANADA: Douglas Engineering Co., Ltd., 190 Murray Street, Montreal 3, P. Q.

SEPTIC TANKS



Two Sizes . . . 300 and 500
gallon capacity. 14 Gauge
Steel, Black Asphalt coat-
ing.

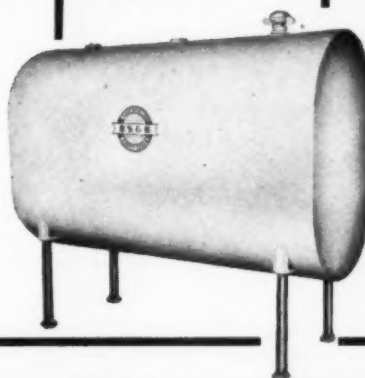
AVAILABLE FOR DELIVERY!

Top quality steel tanks, fabricated by a manufacturer with over 55 years' experience. Write today for prices and complete delivery information.

BLACK, SIVALLS & BRYSON, INC.

24th Floor, Power and Light Building,
Kansas City 6, Missouri

Capacity, 275 gallons. 14
gauge black steel, or alumi-
num. . . . Legs not in-
cluded.



BASEMENT TANKS

WITH THE MANUFACTURERS

FIFTY-SEVEN YEARS AGO a young man named F. O. Schoedinger took his \$600 in savings and some personal notes and bought the stove and kitchen furnishing business of Charles A. Klie, Columbus, Ohio.

That purchase launched a business that long ago grew into an important Columbus industry and today is one of the relatively few concerns in America more than 50 years old. In fact, out of more than 2,000,000 businesses in the U.S. today, less than 3000 were founded more than half a century ago. It also started Schoedinger on a business and civic career that has had few equals in Columbus.

In 1901, Schoedinger added the distribution of sheet metal to his business, and in 1903, he began the manufacture of hospital furniture. By 1905, the business had outgrown the original location and was moved to a large six-story building. There it continued to grow, and 15 years later, it was moved to its present home, which occupies almost two city blocks.

The trade name of FOSCO, under which the firm markets its products, is a combination of the initials "F.O.S." and Columbus. Under that name Schoedinger manufactures such items as galvanized and copper downspouts, special O-G, and hanging gutter and fittings; also distributes tinners', roofers' and furnace men's supplies—including the well known line of Meyer-Weir steel furnaces and International Blue Front cast furnaces.

Kruckman

(From page 71)

more than one-sixth of all this globe. Her Asiatic psychology enables her to create, and persist in keeping the world in an upheaval by propaganda, by pressures, and by power politics and territorial grabs, that keep the disturbances alive perpetually. There are many in Washington, wise students of peoples and places, who are convinced she does not actually intend to fight us, and that she does not think she can lick us. They think she would like us to lick ourselves by our own turmoils, our hysteria, our self-waste.

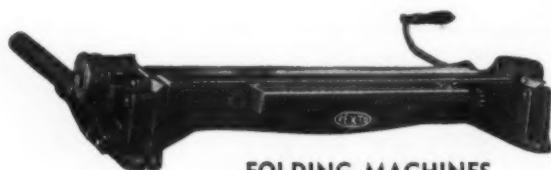
But all this does not mean we should refrain from making ourselves strong, and keeping ourselves strong. The President probably has done the one thing that may cause Russia to back up, if she feels we are utterly in earnest in backing up the President. There is always, as the President himself said, a risk in what we must do. If you play with explosives they may annihilate you. These elements are sometimes uncontrollable as well as unpredictable. But we can't forego what we must do, to say and do it in the only way the Russians understand. That is why mobilization appears to us here in Washington unavoidable and imperative. The faster the better. That, for what it is worth, in the rough manner it has been presented, is how the situation appears to this correspondent near the end of March. It may look different, superficially, or other wise, by the time this is published. We are living in one of the swiftest and most uncertain times of history.

Behind the scenes there are mobilization steps under

PEXTO...INDUSTRY'S CHOICE

Buyers who have invested in Sheet Metal Working Machinery . . . place PEXTO at the top.

The Investment pays big dividends, workers like the smooth, accurate operation, and low maintenance cost.



FOLDING MACHINES



SLITTING SHEARS

10PX48

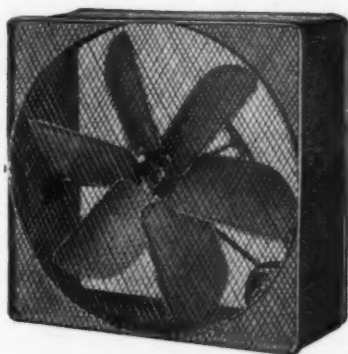
THE PECK, STOW & WILCOX COMPANY - Since 1785 - SOUTHTON, CONNECTICUT, U. S. A.

Breeze Away FROM COMPETITION

WITH



Window Fans



You'll find REX AIRATE Window Fans real pacemakers in the already vigorous competitive race for the buyer's dollar. In design, workmanship, performance, and price, they have everything it takes to win and hold customer preference.

Smart appearance, compactness, quiet operation, and ease of installing and moving, are other inherent features that make prospects consider seriously, compare—and decide on REX AIRATE.

To set a new record for window fan sales this season, be sure to concentrate selling and promotional effort on the complete REX AIRATE line. Three carefully-planned sizes make it easy to meet widely varying requirements. Write for complete catalog information and prices today.

AVAILABLE IN THREE SIZES

Type W-16 — 16" Fan — 1300 CFM

Type W-400 — 24" Fan — 3900 CFM

Type W-500 — 28" Fan — 5100 CFM

Made by the Makers of Rex Blowers and
Blower-Filter Units



2310 Superior Ave.

Cleveland 14, Ohio

AMERICAN ARTISAN, April, 1948

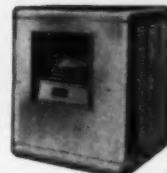
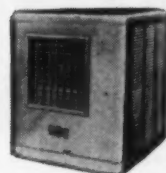
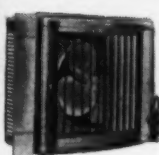
THE NEW 1948

SNO-BREEZE EVAPORATIVE COOLERS

Will Be Backed By The Greatest Promotional
Campaign In The Company's History This Year!



WINDOW BLOWER MODEL



WINDOW FAN MODEL RESIDENTIAL BLOWER MODEL SUPER BLOWER MODEL

LOOK AT THESE DEALER AIDS!

- Trade Magazine Advertising
- Regional Newspaper Advertising
- Cooler Demonstrator Units
- Newspaper Mats & Copy Ideas
- Folders & Catalog Sheets
- Point of Sale Display Cards

Fill in this coupon today!

Palmer MANUFACTURING CORP.
Phoenix, Arizona, Dep't. A-5
Please send free Sno-Breeze literature to:

Name.....
Address.....
City..... Zone..... State.....

39 YEARS OF AIR CONDITIONING LEADERSHIP



When it comes to automatic controls there can be no question about quality. Sampsel inspectors thoroughly test every shipment of material received. If any part doesn't meet specifications, it never sees the production lines. This constant check on quality pays off in few "rejects" on the final testing line. And, by assuring fine performance with minimum servicing, it pays a real bonus to dealers and manufacturers who install Sampsel Controls. Write for new catalog.

Sampsel Time Control, Inc., Spring Valley, Ill.

Sampsel
AUTOMATIC CONTROLS

Canadian Sales Distr: Pease
Foundry Co., Ltd., Toronto



discussion that involve more than manpower. The Munitions Board, a part of the Department of National Defense, is determined we shall have a larger margin of electric power, fuel oil, gas fuel, transport, and communications facilities. The Board is especially worried about power and fuel reserves. And the Board does not believe, frankly, that any part of the problem should be left for solution to those who have established themselves in the National Power Policy Committee. The Committee is dominated by Secretary of Interior Julius A. Krug, Chairman Gordon C. Clapp of the Tennessee Valley Authority, Administrator Paul J. Raver of the Bonneville Power Administration, and Charles R. Wickard, Chairman of the Rural Electrification Administration. The Munitions Board is sharply in disagreement with the social and political ideas of this group, who wish to use the production and distribution of electrical power for socialization. The Munitions Board apparently hopes the President will approve of the plan to apply the principles which stem from practical requirements rather than from any so-called altruistic objectives. The Board expects shortly to go to Congress and ask for prompt and decisive steps to increase the nation's power reserves. It is very likely it will obtain approval of its wish for restoration and expansion of wartime regional electric power pools, as well as other plans.

The National Security Resources Board also has stepped out of its Defense Department obscurity and is proceeding to speed up mobilization of the major segments of the national economy. It is the specific function of this Board to assemble data and informa-

a PEERLESS furnace for every need!

The five PEERLESS furnaces shown here comprise the most advanced line of warm air furnaces ever offered for the home market. Refinements in design and construction give you many advantages with which to outsell competition—and there is a PEERLESS furnace to meet every customer's requirements.

THE SENSATION is a deluxe steel furnace for stoker or hand firing; large blower, automatic humidifier. THE MASTER is an auto-

matic furnace for oil or gas. THE HIGH BOY (illustrated with case removed) is ideal where space is limited; blower forces maximum heat to registers. THE STEEL ROUND-CASE furnace is a favorite for either stoker or hand firing. THE COMBINATION furnace heats economically with either oil or coal.

Write or wire today for complete description of this popular and profitable PEERLESS line.



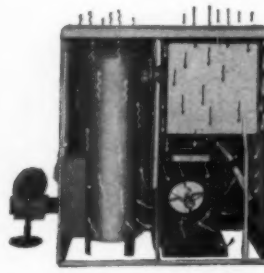
HIGH BOY



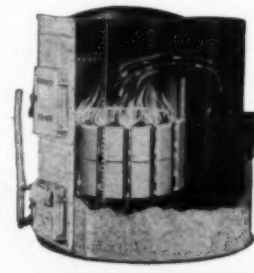
THE SENSATION



THE COMBINATION



THE MASTER



THE STEEL ROUND-CASED

THE PEERLESS FOUNDRY COMPANY

1855 LUDLOW AVENUE
INDIANAPOLIS 7, IND.

WHEN YOU THINK OF HEATING EQUIPMENT —



OIL Quiet, Economical, Space Saving, Zeph-Air Oil Burning Furnaces, Easy To Operate, Easily Installed.

Remember
XX CENTURY

ZEPH-AIR

With It's 54 Years of Engineered Efficiency in The Heating Field



GAS Completely Automatic Air Conditioned Gas Furnaces With The Famous Gear Shaped Cast Iron Radiation Surfaces.



COAL You Buy Quality in Zeph-Air Coal Furnaces. No Costly Service Calls To Worry About.

It Pays To Push Zeph-Air Heating Products — Thousands of Satisfied Users All Over The Country Remember The Dependability And Reliability. Their Zeph-Air Furnaces Stand For.

When a Zeph-Air Furnace Has Ended Its Long-Life and Is Ready To Be Replaced — The Customer is Almost Sure To Say — "Years of Uninterrupted Service," "Install Another Zeph-Air."

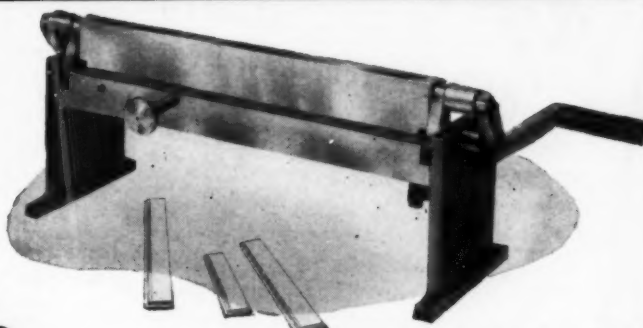
Cash In On This 54 Years of Customer Satisfaction — Stock Up On Zeph-Air Heating and Weather Conditioning Equipment — Now.

THE XXTH CENTURY HEATING & VENTILATING CO.

96 IRA AVENUE

AKRON, OHIO

YOU'VE BEEN WAITING
for THIS!



Available up to 36 inches in length
Pat. Applied For
Announces

Riverside

The "S" Clipper

Over-and-Back-ONCE! — and You've Got a Perfect "S" Clip

And that's the main story except that it is a simple, sturdy machine that will last for years with practically no upkeep. An average operator can easily turn out 4 to 5 hundred clips per hour. You can't afford to be without it.

Better write for full information today

SHAKOPEE

RIVERSIDE MACHINERY CO.

MINNESOTA

**FOR
NEW
FURNACES**

**FOR
FURNACE
REPAIR**



**"Tops"
IN HEAT RESISTANCE
AND ADHESION . . .**

THARCO has successfully withstood temperatures up to 2500° at Detroit Edison and for long periods — that's nearly 50% higher than normal warm air furnace temperatures.

THARCO seals BOTH sides of the joint — gas-tight, smoke-tight — yet it's resilient enough to care for all normal expansion and contraction . . . and, Mister, it STAYS PUT permanently, thanks to the secret Armstrong formula!

THARCO Asbestos Furnace Cement comes in 1-lb. to 350-lb. metal containers — ready to use. See your jobber, or write us today for complete information.

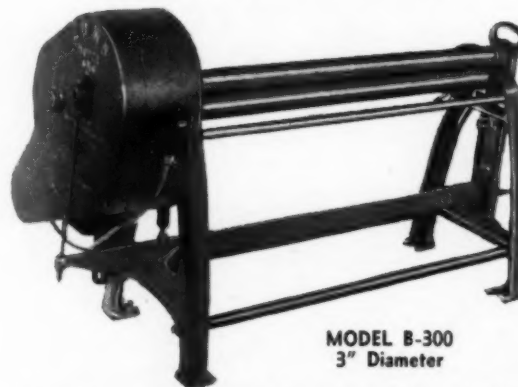
**THE
ARMSTRONG
COMPANY**

4065 SO. LA SALLE STREET, CHICAGO
241 SO. POST AVENUE, DETROIT
319 SO. CROWDUS STREET, DALLAS



tion about all the resources, human and material, tangible and intangible, which may be needful for national defense. It has already set up busy divisions to deal with industries engaged in producing things made of iron and steel, of non-ferrous metals, as well as 24 other major phases of the economy. The primary business of the Board is to mobilize all possible facts which will be necessary to throw industrial mobilization into gear. It will bring together all officials and experts in the various Departments and agencies of the Federal Government, as well as the officials of the various States and other political subdivisions. They will be formed into interdepartmental and inter-governmental committees. These groups will work with the industrial groups, and others. Committees also will be established composed of members of the various industries. Committees will function upon such problems as essential information; legislation; mobilization; requirements; resources, stockpiling; strategic relocation; civil defense activities; scientific and technological developments. It is the main job of this Board to make the information and data available in order to advise the operating agencies. The Board was created by the National Security Act of 1947 "to advise the President concerning the coordination of military, industrial, and civilian mobilization." It consists of the Secretaries of State, Defense, Treasury, Interior, Agriculture, Commerce and Labor. Arthur M. Hill, Chairman of the Board of the Greyhound Bus Lines, heads the Board. He has as counsellors Vice President William H. Harrison of the AT&T, and President Charles E. Wilson of General Electric.

LOWN Slip Roll Forming Machines FIT YOUR JOB!



**MODEL B-300
3" Diameter**

If you want **MORE PRODUCTION** and **ECONOMICAL OPERATION**, use LOWN Slip Roll Forming Machines.

Our machines are designed for sturdiness and ease of operation to provide peak productivity.

Rugged — Rigid — Attractive — Prompt Deliveries.

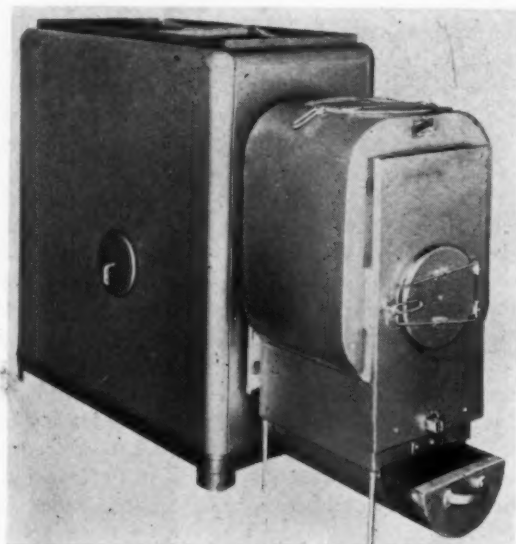
The LOWN Slip Roll Forming Machines are built in a range of sizes from which you can choose the exact unit for your requirements, with roll diameters 2" through 6".

San Angelo Foundry & Machine Co.

San Angelo, Texas E. Upton & SFE Tracks
Distributors in Most Principal Cities — Write for Bulletins.

TJERNLUND "QUICK HEAT" LEADS THE WAY!

Announcing A New Addition to Our Growing Line



COAL AND OIL IN ONE UNIT WITH EXCELLENT RESULTS

FEATURES:

With our efficient hopper fed coal attachment coal can be used with "Quick Heat" units without removing the oil burner.

Both coal and oil can be burned simultaneously or separately with equally efficient results. In case of power failure or on new construction coal unit can be attached and will provide adequate heat with "Quick Heat's" excellent gravity circulation.

Our coal unit has vital parts constructed of high grade heat resistant stainless steel.

We also manufacture ceiling and wall hung industrial oil burning units in sizes up to 700,000 Btu's.

WRITE FOR LITERATURE AND INFORMATION

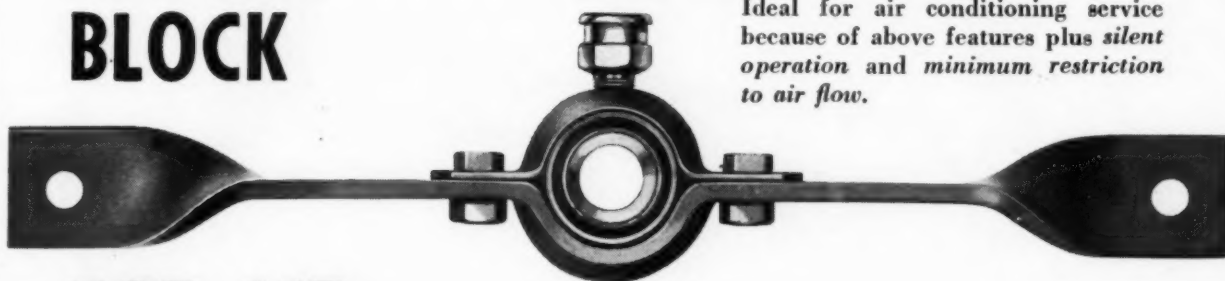
Manufactured by

The TJERNLUND MFG. CO. 2140 KASOTA AVE., ST. PAUL 8, MINN.

THE IDEAL PILLOW BLOCK

UNIQUE engineering encloses Bushing, Cushion and Sealed Oil Reservoir in compact pressed steel ball. Perfect self-alignment through ball and socket action. Built-in oil-proof synthetic rubber cushion absorbs vibration. Porous bronze bushing, wick fed from large oil chamber, insures long-time lubrication.

Ideal for air conditioning service because of above features plus *silent operation* and *minimum restriction to air flow*.



FOR AIR CONDITIONING

This bridge tree is one of several types of mountings. We are glad to cooperate with engineers in designing mountings to meet their specific needs. Tell us your problems and we will send illustrations, specifications, and complete information.

TRIANGLE MANUFACTURING CO.
392 Division Street Oshkosh, Wisconsin

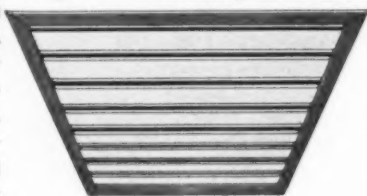
AIR-FLO AUTOMATIC CEILING SHUTTER



TOP VIEW -- OPEN -- LESS MOULDING

FOR
FANS
ATTIC

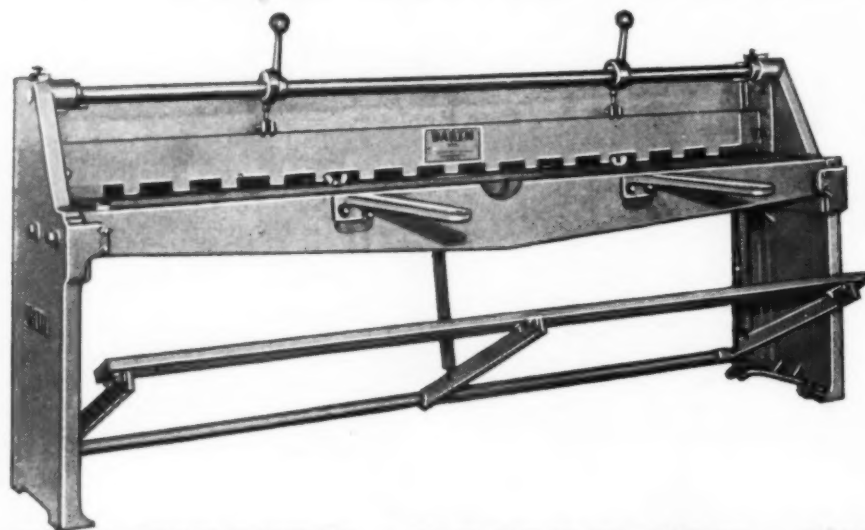
Built so they can be installed practically flush with the ceiling, AIR-FLO Ceiling Shutters present a refined, finished appearance. Their natural aluminum color blends with any decoration, eliminating need for painting, and no grille or winter cover is required. Furnished in 5 different widths, single panel up to 73" long. No operating mechanism shows. Built-in fusible link. Meets Fire Underwriters requirements. Write for illustrated catalog 42-C of the complete AIR-FLO line.



VIEW FROM BELOW -- CLOSED
(with moulding)

AIR CONDITIONING PRODUCTS CO.
2340 W. LAFAYETTE BLVD. DETROIT 16, MICH.

Another activity that has become very busy is the organization of the work forces through the Organized Reserves. In the next war the Army intends the armies gathered around regular armed services shall be fighting men, and the men in the Reserves shall be gathered from specialized workers of industry, and shall be organized into more or less homogeneous work forces, for the purpose of doing what they are most accustomed to do in their daily jobs. Usually these work soldiers are organized where they work, in their own plants and shops, under their own leaders, from among whom are chosen the officers who are commissioned as Lieutenants, Captains, Majors, and Colonels, with full military rank. The larger groups also have Generals. Commissioned officers usually are picked from among the men who have had military experience. Veterans are given preference for commissions and non-commissioned grades. A veteran who has had a certain grade in the Army or Navy, usually is started in the Reserve work force at the same grade or rank. Those who have had no military training, together with those of experience, are given a certain minimum of necessary military training, taught to handle arms, and are required to become soldiers in the full term of the word as it applies to other members of the armed forces. The pay is the same as the pay received by other soldiers. In the event the President declares a state of emergency they will be called to the colors exactly as are other troops. The Organized Reserves undoubtedly already are active in some sections of your industry; you may be certain practically every part of your industry will be requested to become part of the



LONG LENGTH SQUARING SHEAR

Foot Operated

THE OUTSTANDING VALUE IN SHEARS OFFERED TODAY, this Long Length Shear is extremely popular with air conditioning and roofing establishments. A very sturdy Shear in 96" cut, of 18 gauge soft steel capacity. Furnished regularly with self-locking holddown operated by manually controlled eccentrics. Also available with new type two-wheel parallel precision back gauge.

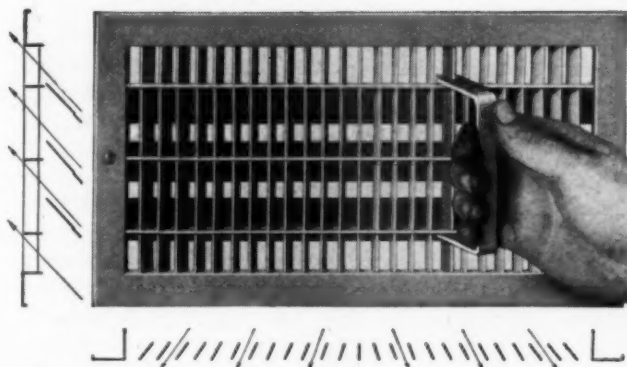
Write us for details concerning our complete line of Sheet Metal Working Machines!

THE BARTH MANUFACTURING CO., MILLDALE, CONN., U.S.A.

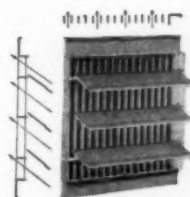
INDEPENDENT

"Fabrikated"

WALL GRILLES WITH DEFLECTING VANES



Style 321-A grille
with deflecting vanes



Rear view showing
adjustable deflect-
ing vanes



Always Leading—Always Progressing

THE INDEPENDENT REGISTER CO.

3747 E. 93rd STREET • CLEVELAND, OHIO



ACCURATE and positive compound deflection of air flows can be readily secured with these "Fabrikated" grilles. Directional adjustments may be made when grilles are installed; or grille bars and vanes may be adjusted after installation to meet unforeseen or changed requirements.

Each grille bar and each deflecting vane is adjusted *individually* with a special two-pronged tool included with each shipment. Locking of grille bars and vanes is not required because they are held firmly in place—no vibration—no rattle.

Write for Our New Catalog No. 48.

KOPPERS is promoting

Plastipitch Protected Metal Buildings in*



Tie up to PLASTIPITCH Protected Metal

Cash in on the advertising of this Koppers product. As a further help, sheeting contractors are furnished complete engineering information on Plastipitch including necessary working drawings. There is a nominal charge for this service.

Koppers maintains, through its approved distributors, warehouse stocks of Plastipitch Protected Metal in each major trading area. This makes it easy for you to obtain sheeting locally and quickly. All erection is handled through sheeting contractors.

If you are interested in using Plastipitch on your jobs, contact the nearest Koppers district office listed below. Send for the engineering manual on Plastipitch.

KOPPERS COMPANY, INC.

Pittsburgh 19, Penna.

(* Trade Mark Reg. U. S. Pat. Off.)



DISTRICT OFFICES: PITTSBURGH: Koppers Bldg., Telephone: ATLantic 6240—NEW YORK: 449 South Ave., Westfield, N.J., Telephone: Westfield 2-4480 or New York City—REctor 2-5194-5—PROVIDENCE: 178 Massasoit Ave., E. Providence 14, R.I., Telephone: E. Providence 0312—BOSTON: 250 Stuart Street, Telephone: Liberty 6525—NEW HAVEN: 251 East Street, Telephone: New Haven 7-2811—BIRMINGHAM: Woodward, Ala., Telephone: Birmingham 8-1611—ST. LOUIS: 4000 Bingham Ave., Telephone: HUdson 2710-11—CHICAGO: 431 Railway Exchange Bldg., 80 East Jackson Boulevard, Telephone: Harrison 0662.

Speed Up Orders With a

BEVERLY SHEAR

Throatless shears
that cut any shape
... straight, cir-
cular or irregular.
FASTER — accu-
racy! Order No. 1

for 14 gauge. No. 2 for 10 gauge.
No. 3 for 3/16 inch mild steel and
10 gauge stainless. Available with or
without stand.

BEVERLY SHEAR MFG. CO.
3001 W. 110th Place Chicago 43, Ill.



Organized Reserves. The most completely integrated Organized Reserve Corps in existence is the unit organized by the Associated General Contractors Association. This group to date has 72 units, located in all States. The Reservists are engineers, bridge builders, road builders, skilled construction workers, and other technical and professional workers, employed in what is generally called the heavy construction industries, as well as the building industries. They are under the general supervision of the Corps of Engineers, and will be employed as the builders and maintainers of railroads, military works, roads, highways, buildings, dams, electric lines, harbor works, and every other type of construction known to military men. This unit has its own over-all commanding General, who in turn has his own national staff.

Names in circulation here as prospective heads of the organization which will administer the Marshall Plan are: Defense Secretary Forrestal; Undersecretary of Army Draper; President Wilson of General Electric; former Mayor Lapham of San Francisco; President Hoffman of Studebaker; Chairman McCloy of World Bank; former Secretary of War Woodring; Ferdinand Eberstadt; and Undersecretary of Navy Sullivan. Actual arrangements already have been under way for the procurement of the commodities and materials to be shipped overseas. Men and women who were employed in purchasing lend-lease inventories at Treasury during the war, and who were part of WPB personnel, have been assigned to do the preliminary negotiating for the Marshall Plan purchases. On a purely tentative and unlegal basis these officials, who are located in

"Weathercrafters for the Nation"

**YOU'LL PAT YOURSELF
ON THE BACK
THIS SUMMER**



IF

**YOU ARE WELL
STOCKED WITH**

GREAT NATIONAL EVAPORATIVE COOLERS



*Write for
12 Big Reasons
Why Great
National Represents
the Biggest Dollar
Value in
Evaporative
Cooling*

Factory Representatives
Gillespie & Company
1007 Candler Bldg., Atlanta, Ga.
Crescent Sales Company
2155 E. 7th St., Los Angeles 23, Calif.

GREAT NATIONAL AIR CONDITIONING CORP.

2125 North Harwood

Dallas, Texas

AMERICAN ARTISAN, April, 1948

You're Sales Ahead When You Handle the
COMPLETE Skuttle LINE
of Quality Humidifying Equipment!



FINGERTIP
CONTROL SWITCH

OVERFLOW

TO COLD WATER LINE

SERIES 600

Your best bet for bigger, better business... the new Skuttle Series 600! It's the one and only self-flushing, self-cleaning, fully automatic humidifier and it meets most humidifying requirements. Quickly, easily installed! Adaptable to sloping bonnets or straight plenums of both gravity and forced air furnaces. You need carry only one in stock!

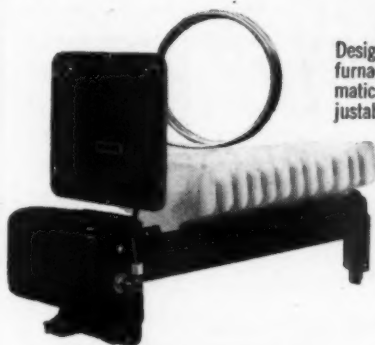
SERIES 500

Skuttle's Series 500 Automatic Humidifier is particularly recommended for gravity type furnaces having curved plenum. Among its important quality features are adjustable collar that fits sloping or vertical bonnets, automatic anti-siphon float control valve, adjustable rear support for levelling. Pan sizes from 16" to 28" long.



SERIES 300

Designed especially for forced air type furnaces, the Series 300 Skuttle Automatic Humidifier is equipped with adjustable collar that fits all bonnets, drawn seamless copper tank and pan, automatic anti-siphon float control valve, and large inspection door and frame. Pan sizes from 16" to 24" long.



VAPOGLAS PLATES MEAN REPEAT PROFITS FOR YOU!

For top efficiency, evaporating plates should be replaced once each heating season. And Skuttle's patented Vapoglas plates can bring you this yearly repeat business from every installation you make. They absorb 70% more water per pound than ordinary ceramic composition plates assuring maximum moisture output.

Cash in with Skuttle's complete line of quality humidifiers and keep on cashing in year after year with Skuttle's exclusive Vapoglas evaporating plates! See your local jobber now... or write today for state listings and the complete Skuttle Profit Story!

All standard units equipped with 5 ft. copper tubing, saddle and needle valve.

Skuttle
MANUFACTURING CO.
4099 BEAUFAIT
DETROIT 7 MICHIGAN

Whether you make Whippers...



... or pots and pans, or trucks, or stoves, or any product fabricated of metal... you'll be interested in the story of Mr. Widget. He was faced with the

dilemma of wanting to use resistance welding but not having sufficient plant transformer and distribution facilities to handle the extra load. Also the power people frowned on the addition of a low power factor load.

How Mr. Widget became a "Man of Success" with the aid of "THREE PHASE" is briefly told in the booklet; "How Mr. Widget Made More Whippers." Your copy is waiting—just drop us a post card. You'll find it well worth the 3 minutes reading time (not counting technical stuff.)

This is a Sciaky "THREE-PHASE" Spotwelder. It's a self-contained unit that delivers the same welding capacity on 1/3 the KVA demand—draws a balanced three-phase load at near unity power factor. Big and little machines are available for every requirement. Write for details.



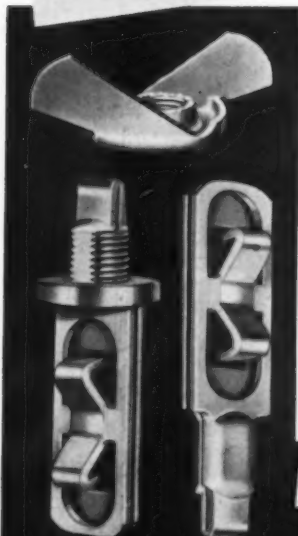
SCI AKY

Manufacturers of a complete line of resistance welders
Offices in New York, Detroit and Dayton
Representatives in Principal Cities

SCI AKY BROS., Inc., 4907 W. 67th St., Chicago 38, Ill.

E-Z-ON

DAMPER CONTROLS
Put the Damper
on Noise



E-Z-ON Damper Controls punch their own holes, rivet themselves and allow full air flow. When you use them, you practically eliminate noise tendency in the mechanical heating, ventilating and air-conditioning systems you install. Depend on them for savings in time and money, and for improved installations.

Order from your jobber today.

M.A. GERETT CORP.

MILWAUKEE 5, WISCONSIN

the commodity branches of the Department of Commerce, work out every detail with a manufacturer or supplier, and give him the necessary specifications and arrange prices, so that the final steps are reduced to a minimum when the Marshall Plan actually becomes law. Applications also are being taken by the personnel office in Commerce from those who seek employment in the new prospective agency. To be certain that no adequately trained men or women may be lost when the big need for people is upon them, the Commerce Department has placed over 700 (whom they had to "separate" because Congress cut their appropriations) upon official leave. This ties them into the organization, gives them proper status, yet does not put them on the payroll. There will be a tremendous demand for new people in Government service when the Marshall Plan begins to operate, and when the 3,000,000 men are listed and gradually called into the Selective Service, as well as the Universal Military Training operation.

Effect on This Industry

None of the products of your industry apparently are on the restricted export list, nor are there any export quotas, so far as this correspondent can find out. This means that either the products are expected to be obtained "off shore," which means from foreign sources (such as England), or that they are in sufficient abundance, so that there is no concern that their export to Europe will cause domestic shortages. The British have made a hard fight to make England the principal source of supply for hardware. They were



GREATER DEALER PROFITS!

- ★ LOWER COST TO YOU . . . production line assembly.
- ★ PACKAGED UNIT . . . no set up required.
- ★ EASILY SERVICED . . . all standard parts used.

Can be delivered to average basement completely assembled. Where necessary canopy and burner can be removed in a matter of minutes reducing length to 4 feet.

HEAVY STEEL BOTTOM eliminates cementing.

SHIPPED COMPLETE WITH: Gun Type Oil Burner (Underwriters approved). 12" Blower (with motor). Stainless Steel Comb. Chamber. Standard Size Filter. Automatic Drip Humidifier. Automatic Draft Regulator. Thermostat, Stack Switch. Comb. Fan & Limit Control.

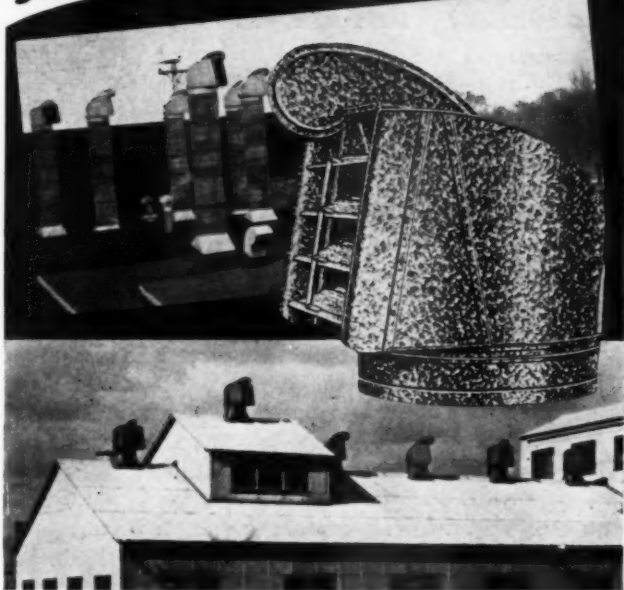
SPECIFICATIONS:

Length overall	62 in	Height	52 in
Width	24 in	BTU Cap. (at bonnet)	100,000
			525 lbs

Manufactured by
STANDARD HEATING EQUIPMENT CO.
Waterloo, Iowa



Suggestions for More Business:



...Two ways to install your favorite gravity ventilator— **Swartwout Rotary**

Don't overlook the many opportunities in your community for helping factories and shops of all kinds to solve ventilating problems. Roof ventilator installations often lead to needed roof repairs and other extra metal work. For instance, in one view above, Swartwout Rotary Ventilator had to be mounted on stacks to clear the air-current influence of nearby buildings. . . . In the Swartwout Line are all the types you need for commercial and industrial ventilation requirements. Be sure you have our latest catalog, Bulletin 324, for convenience in ordering.

The Swartwout Co.

18615 Euclid Ave. Cleveland 12, Ohio



Swartwout
Controlled Air Circulation

EQUIPMENT FOR EFFECTIVE ECONOMICAL
VENTILATION OF INDUSTRIAL BUILDINGS

AMERICAN ARTISAN, April, 1948

Genuine Joe says
"Don't be Slow..."

**Keep small motors
moving out fast! Stock**

Wagner
Motor Armatures"



It's easy to repair small motors when you have a supply of Wagner *Ready-To-Use* Armatures on hand. Three simple steps...and the job is done.

1. Remove old armature.
2. Install a complete new Wagner armature.
3. Test the motor and ship it out.

Keep genuine Wagner Motor Armatures in stock, and release your winders for more profitable work on the larger sized jobs.

Order them today from any of the 450
Authorized Service Stations or Parts Distributors
displaying these signs.



Write for **CATALOG MU-40**

Every repair shop needs one. It helps
determine the catalog number and
price of Wagner Motor Parts.



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ST. LOUIS 14, MO., U.S.A.

ELECTRICAL AND AUTOMOTIVE PRODUCTS

FREE!



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THE NEW CHASE

THRU-WALL *Copper* FLASHING
(3-Way Bond!)

YOU'LL want to know about the unique saw-tooth corrugations that bind the masonry both laterally and vertically in every direction—a 3-way bond flashing that's priced economically!

Remember, too:

- 1 When you install Chase Thru-Wall Copper Flashing, you offer the best buy—pay no more.
- 2 Easily bent by sheet metal contractor.
- 3 Available through 22 Chase warehouses and through distributors.
- 4 Supplied in 6' lengths, resulting in economical installation costs.

Mail coupon today to Dept. AA48!

Please send free descriptive literature about Chase Thru-Wall Copper Flashing.

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BRASS & COPPER CO.

INCORPORATED
Waterbury 91, Connecticut
SUBSIDIARY OF KENNECOTT COPPER CORPORATION

—This is the Chase Network—handiest way to buy brass—

ALBANY† ATLANTA BALTIMORE BOSTON CHICAGO CINCINNATI CLEVELAND
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MINNEAPOLIS NEWARK NEW ORLEANS NEW YORK PHILADELPHIA PITTSBURGH
PROVIDENCE ROCHESTER† SAN FRANCISCO SEATTLE ST. LOUIS WATERBURY
(†Indicates Sales Offices Only)

here for weeks in consultation with the various inter-departmental committees. Apparently a large part of the hardware to be used in connection with the Marshall Plan will be procured in England. That may also be the idea in connection with other supplies.

Credits & Collections

(From page 74)

Paradoxically, when business begins to slacken, there is a tendency to overload the customers with credit purchases, many merchandisers bombard them with suggestions to buy on terms. In retail circles, many believe that ready cash is not available to consumers to the extent that it was in recent years, that savings are less, and so, there may be a flurry of suggestions to buy on credit from merchants who prefer to speculate on this business rather than carry shelf-warmers or take mark-downs. A businessman may be prudent with his wares and limit his credit customers wisely but he must consider the outside influences that are beguiling his trade with liberal credit terms. It isn't easy to get the lowdown on what a credit customer is buying elsewhere but it is possible to watch his paying habits, to utilize a systematic collection routine so that the moment he becomes delinquent, he gets a "Please pay." The businessman who follows up his delinquents regularly has more chance of getting his money before the other creditors clean out the till.

In the days when America was young, the merchant could keep his eyes on the cracker barrel and earn a tidy profit. Today, the merchandiser of wares or

CLEAN EVERY TYPE of FURNACE

QUICKLY EFFECTIVELY EFFICIENTLY

with a

GRAND RAPIDS *deluxe* FURNACE CLEANER



Large air volume and high velocity give the Grand Rapids Furnace Cleaner maximum recovery capacity. This means faster, more efficient cleaning for every type of furnace or boiler . . . plus more jobs and larger profits for you. Standard groups of attachments available with each Furnace Cleaner are designed to reach into and clean every part of the heating plant.

Service your furnace cleaning jobs with a Grand Rapids DeLuxe Furnace Cleaner. It is sturdy, long wearing and constructed to do a thorough cleaning job under the roughest conditions. Write today for information.

DOYLE VACUUM CLEANER CO.

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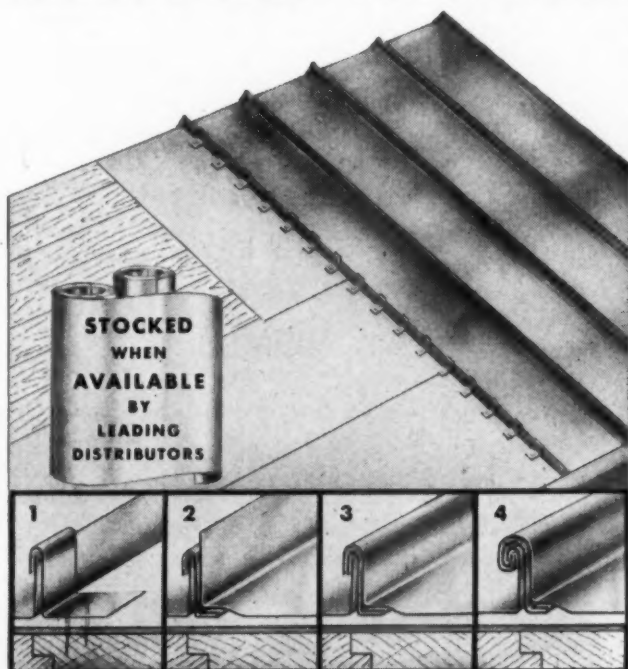
AMERICAN ARTISAN, April, 1948

standing seam roof without cross-seams

using

FOLLANSBEE

SEAMLESS TERNE ROLL ROOFING



Four steps in producing standing seams with Follansbee Seamless Terne Roll Roofing.

There's no job too difficult for FOLLANSBEE SEAMLESS TERNE ROLL ROOFING, and, you can save time and money because cross-seam soldering is eliminated.

Follansbee Seamless Terne Roll Roofing is easy to handle, too. Panels of any required length can be cut from the 50-foot rolls right on the job.

On your next maintenance or repair contract it will pay you to try FOLLANSBEE SEAMLESS TERNE ROLL ROOFING.

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COLD ROLLED STRIP • POLISHED BLUE SHEETS • ELECTRICAL SHEETS
SEAMLESS TERNE ROLL ROOFING

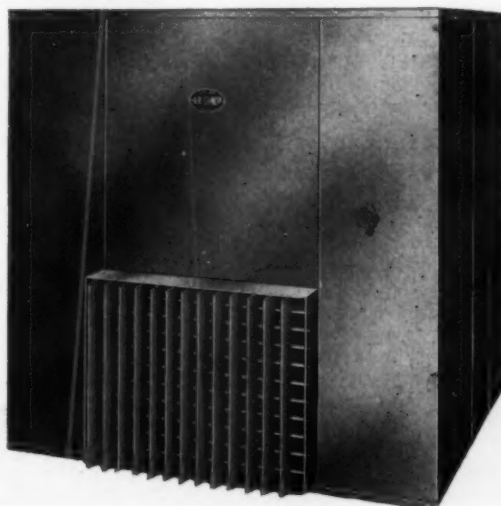
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YOU'RE READY WITH

AIR-CHAMP

Evaporative Cooler

IMMEDIATE DELIVERY ON ALL SIZES



Here are the features that have sold more than 5,000 AIR-CHAMPS in three years:

- Cabinet built entirely of galvanized steel. Only AIR-CHAMP has this feature.
- Turbospray water distribution assembly—one simple assembly for water recirculation and distribution. No pump troubles.
- Two sets of mats—eliminate any "pull through" of water. Fiberglass mats optional.
- Air Washer section contains all water. No water in blower system.
- Heavy duty blowers—sized for full air delivery. Top quality Wagner and Century Motors.

Finest possible construction throughout minimizes service "call backs". The entire unit is built to operate noiselessly, efficiently and economically. Clip and mail coupon below for complete price information and free folder.

FREE AIR-CHAMP FOLDER

ALTON MANUFACTURING COMPANY

1112 Ross Avenue
Dallas 2, Texas

Please send me, by return mail, your free illustrated folder on the 1948 AIR-CHAMP with complete price information. I am also interested in items checked below.

- ☐ grilles
☐ blowers

- ☐ attic fans
☐ air washers

Name

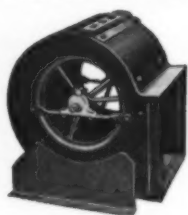
Firm

Address

City State

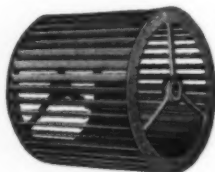
• BLOWERS •

for
Air Conditioning Furnace Manufacturers



The New Bishop & Babcock
Air Conditioning
Blower Assembly
Type "AC"—Design 2

The New Bishop & Babcock
Blower Wheel
For Air Conditioning
Furnace Blowers

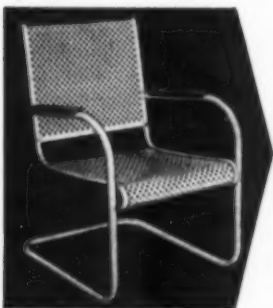


The New Bishop & Babcock
All Stamped
Housing Assembly
and Component Parts

Write for Bulletin No. 115

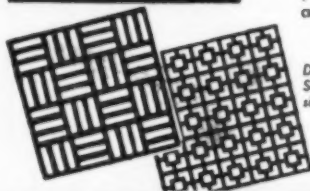
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The BISHOP & BABCOCK Mfg. Co.
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TROY SUNSHADE COMPANY CASE HISTORY: H & K PERFORATED METALS "An Excellent Outdoor Material"



In modern outdoor furniture—such as the fine products of the Troy Sunshade Company, Troy, Ohio—H & K Perforated Metals play a very prominent role . . . providing practical utility with lasting beauty.

Whether you need Perforated Metals such as Stainless Steel or Monel, or diverse materials like plywood, plastics, rubber and fabrikoids, consult H & K. Backed by 65 years precision perforating of materials for use in screens, grilles, filters, ventilators, etc., H & K gives you a wide range of sizes, shapes and spacings.



Don't forget—H & K "Make Your Own" Safety Guards . . . strong, safe, inexpensive. Ask about them!

The
Harrington & King
PERFORATING CO.

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service, to keep on the right side of the ledger, should extend his horizon and appraise external factors as well as internal operations. At this time, it would seem prudent, in the light of recent developments, to begin checking credits more carefully and see that customers pay according to the terms of sale.

Inventory (From page 75)

Below the product name, wholesaler's address, and maximum and minimum stock numbers, the cards should be ruled vertically and horizontally. In the vertical columns, mark these notations:

Quantity Purchased
Quantity Drawn Out
Total on Hand
Cost
Unit Cost
Extended Unit Cost
Mark-up Percentage
Selling Price.

As you buy stock, enter the quantity in the first column, and the total number this put in your stock in column three. Enter the cost of this order in column four.

The unit cost (arrived at by dividing the quantity by the total cost) goes in column five. Then *average* the entire stock to arrive at a figure for column six. In other words, take the cost of all items of this merchandise in stock, and divide by the total number you have (including the new ones). This gives you the

How to Sell STOKER HEAT AT A PROFIT!

Here's your market! In the area where you sell, chances are 2 to 1 that the majority of homes, apartments, etc., are heated with coal. That's true all over America . . . for coal is still the most economical way to heat most buildings!

Here's your fuel! Coal is the only fuel whose production exceeds present day demand.

Here's your stoker! ANCHOR is not an "assembled" stoker. It is an engineered stoker . . . for both BITUMINOUS and ANTHRACITE EQUIPMENT. Made and sold for many years, it has proved, in actual use, to be a leader in fine, dependable coal burning equipment. Prepare to sell ANCHOR STOKERS while the time is right! Anchor Division, Stratton & Terstegge Co., Inc., P.O. Box 311, New Albany, Indiana.



Also
Manufacturers of



ANCHOR
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"America's Finest Automatic Coal Burner"

WHITNEY-JENSEN PRODUCTS

38 YEARS EXPERIENCE



No. 5 JR. PUNCH

FURNISHED IN METAL
or PAPER BOX

Weight 2 3/4 lbs.
Capacity 1/4" Thru 16 Ga.

7 Punches
and Dies

3/32", 1/8", 5/32",
3/16", 7/32", 1/4", 9/32"

Nos. 7, 7 1/2, 8 METAL PUNCHES


Capacity—1/4" Thru
1/8", 3/16", 1/4"



Punches and Dies available
3/32" thru 1/2" by 1/64" variation

WHITNEY METAL TOOL COMPANY
91 FORBES ST. • ROCKFORD, ILL.

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PUNCHES

Rotex 18 is ideal for any shop fabricating sheet material. Changes instantly... 17 sizes from 5/32" to 2", with 2" nibbling shear. Clean, fast, accurate... 10-18 gauge capacity. Used by small and large shops—Fisher Body, General Electric, Lockheed, Douglas, many railroads. First cost is lower, yet the Rotex does more work faster, better.

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Make Your Humidifying Jobs Automatic and Trouble-Free!



National Plumbing
Laboratory
Approved Against
Back-Siphonage

No. 5900-F WATER-BOY
FEED VALVE furnished
complete as illustrated.



Complete unit that enables you to convert any hand fed pan into an automatic humidifier. Easily and quickly installed. Thumb screw adjustment permits control of water line. Fully adjustable for varying water pressures. Reservoir outlet can be furnished

on either side or end. Shipped with all necessary fittings and installation instructions. In every way a first-class, dependable outfit; corrosive-resisting, brass and copper construction—nothing finer to be had. And priced RIGHT for you to make a liberal profit.

WRITE US TODAY for engineering data and prices on entire MAID-O-MIST line which also includes complete automatic humidifiers and heating specialties of highest grade... or see your jobber!

MAID-O-MIST INC.

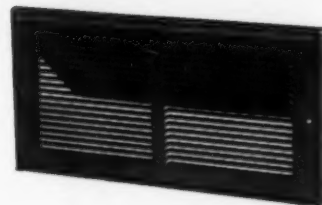
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The Line
THAT SATISFIES EVERYONE:
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Experience has proved that the Effecto-Grille line has the acceptance of the warm-air trade... Modern Streamlined Features, Top Performance and Triple Airflow are big advantages to the contractor and home owner.

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NEED REPAIRS *Quickly?* TRY DES MOINES

HERE at Des Moines Stove Repair we're set up to supply you with the best repair parts in the fastest possible time. We know what delayed orders mean to you in wasted time and money, so we fill the smallest order or the largest promptly.

We'd like to point out now that there's a good field awaiting the aggressive heating man in converting oil-fired heating plants to coal. We can supply the parts you'll need for these conversions and we'll get 'em to you without delay. Better investigate the prospects in your territory.


Anything you need for that spring repair work—filters, parts, furnace cement, registers, etc.—is available quickly and easily from Des Moines Stove Repair Co.

Write us today!

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DES MOINES, IOWA
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COAL BURNER

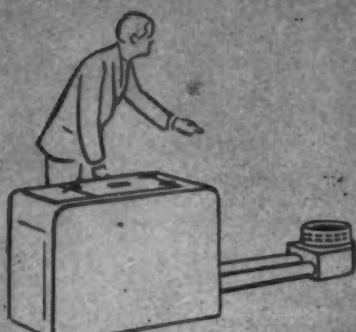


THE SHIELD
OF QUALITY

ECON-O-COL

The "Stronghearted" Stokes

BUILT BY COTTA TRANSMISSION
COMPANY • ROCKFORD, ILLINOIS



extended unit cost, which is an average cost for everything in your stock, taking care of price rises and reductions.

In the second-to-last column, indicate the percentage mark-up you intend to get on this item. Adding this to the extended unit cost figure, enter your selling price in the last column.

On the horizontal columns, mark the dates on which you draw out units for installation or sale, and the dates on which you add to your reserve stock. If you are drawing six filters out of stock to replace worn filters in units you service, mark the date you take them out of inventory on the horizontal column. Then, going across, put the figure six into column two, and subtract six from the number above in column three to find out the total on hand. If this total sinks below the minimum number marked at the top of the card, you know that it is time to order an additional stock from the supplier.

That's all there is to it.

Neubecker
(From page 89)

At right angles to O-7 from point O draw the line O-d equal to the vertical height between points O and 7 in the side elevation as shown by 7-d. Draw a line from 7 to d in the true lengths which will be the true length of 7-O in plan. For the balance of the true lengths of the dotted lines 1-6, 2-5 and 3-4 in plan, set off these distances in the diagram of dotted true

PERFORMANCE PLUS! ATH-A-NOR Furnaces and Parts

* * *

Performance is the yardstick for measuring the efficiency of any heating plant, and those that will operate year after year with little or no attention are the ones which will return you the most profit.

You're sure of top drawer performance when you install ATH-A-NOR Furnaces and parts exclusively. Over fifty years of furnace manufacturing experience guarantee you home heating plants with performance ratings and lasting qualities to satisfy the most critical clients. Investigate now . . . write for literature.

MAY-FIEBEGER COMPANY

*Manufacturers of Quality Heating Equipment
for Over Fifty Years.*

Newark

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It's Here...The New Low Cost CHILL-AIR Recirculating High Quality Pump



Here's a big profit maker at minimum cost! Designed for Evaporative Coolers, Coolants for lathes and machine tools, Fountains, Displays and all light industrial pump uses.

The heavy duty totally enclosed motor, with moisture proof vacuum-impregnated field coils, has a stainless steel shaft; large, easy oiling, permanent alignment oilite bearings that require only one oiling during the cooling season. Cast brass pump bracket and impeller housing (die stamped brass impeller).

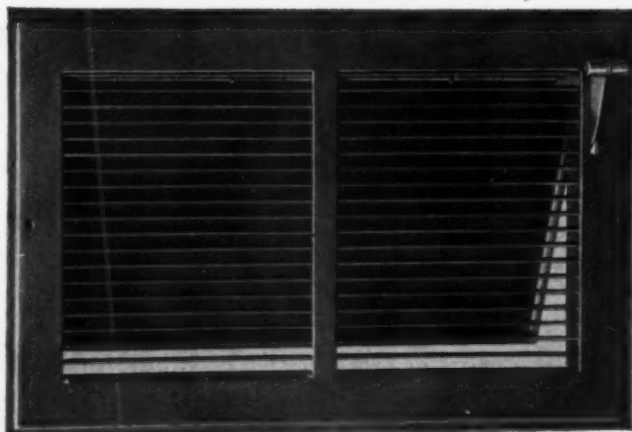
This "quiet" large capacity pump consumes only 60% of motor capacity under full load. It's trouble-free and has no equal in excessive humidity applications.

GUARANTEED FOR ONE YEAR

Distributors: Few choice territories open. Write for details.

Dealers: Order sample from manufacturer now. A Chill-Air Distributor in your territory will serve you.

Manufactured by
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Sidewall Register	- -	Immediate Delivery on 5" & 6" Heights	#20
Sidewall C. A. Grille	-		#28
Baseboard Register	-		#24
Baseboard C. A. Grille	-		#27
Floor Faces	Prompt Delivery - - -		#50

MIDCO REGISTER CORP.

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Factory Representatives Wanted for Some Territories.



New! HEXDALL DUCT HANGERS

U. S. Patent No. 2264666

Hang ducts like "greased lightning"... make more money on each job... save up to 92% on labor with these sensational new cadmium-plated duct hangers. No special tools. You minimize strain on your men, reduce accidents. No lost or worn-out tools. Eliminate strip steel, nails, screws, bolts, rivets, or wire... handle all types of duct material, including aluminum. Get free samples and free folder—write us today, including name of your favorite jobber!

A. M. HEXDALL CO.
MORRIS, ILLINOIS
Manufacturers of Sheet Metal Specialties.

JOBBER AND SALES AGENTS... This new development is the sales sensation of the sheet metal industry. Write for information about territories available, literature, samples, and prices.



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General Filters thinks you are if you don't install a General Filter for every one of your fuel oil burner customers. It's a "good deal" for the customer since it greatly aids in eliminating troubles due to clogged nozzles and it's a profitable service item for you. If you haven't already done so, investigate by writing to your jobber or directly to us.

GENERAL FUEL OIL FILTER

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EASY EXTRA PROFITS on every Automatic-Heat installation

Lowest Cost
**HOME INCINERATION
available!**

Low cost and "self-burning" action bring quick sales for this easy-to-install incinerator—especially where automatic heating prevents rubbish-burning in the furnace! Burns wet or dry garbage and rubbish; advanced down-draft action dries the waste constantly. Contents need be ignited only once or twice a week; ashes removed only once or twice per month. Unit is only 2 feet in diameter, less than 3 feet high! Uses any 8-inch flue; will not affect heating-plant efficiency if tapped to furnace flue. Handsome silver-and-blue duotone finish! Write for details!

The Majestic Co.
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Majestic
**No. 30 FUELLESS
HOME
INCINERATOR**



Nationally Advertised Home Necessities for Over 40 Years.

MAPLEWOOD HUSKY-LITE COMBINATION MACHINE

20 Gauge Capacity - Immediate Delivery



A HUSKY—LIGHT WEIGHT ALL-PURPOSE MACHINE, made from SPECIAL ALUMINUM ALLOY. Weight (less standard) 15 lbs. Equipped with steel cut gears. Steel rolls (2" long) are machined, hardened, ground and keyed to fit shafts.

A large interchangeable gauge (3 1/4" x 2 1/2") and handles for either top or bottom shafts permits clockwise or counter-clockwise operation.

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TURNING
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SINGLE BEADING
O. G. BEAD ROLLS
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SEE US FOR—

Pittsburgh Lock Machines, Roll Forming Machines, Roller Dies, Pipe and Elbow, Beading, Turning Machines and all other Sheet Metal Working Machinery.—Your inquiries invited.

MAPLEWOOD MACHINERY CO.
2634 FULLERTON AVE. CHICAGO, ILL.

lengths as shown by similar numbers on the vertical line O-4. Find the altitudes for these dotted lines from the side elevation by taking the vertical heights between points 1 and 6, 2 and 5 also 3 and 4 as shown respectively by 6-e, 5-f and 4-g, which are set off on lines drawn at right angles to O-4 in the true lengths from 1-2 and 3 thus locating intersections e-f and g from which lines are drawn to 7, 6 and 5, respectively, which are the true lengths of similar numbered lines in plan.

Developing the Pattern Shape

Take the distance O-8" in the end elevation and set it off as shown by O-8 in the pattern. Now with 8-7 in side elevation as radius and 8 in the pattern as center describe a short arc near 7 and intersect it by an arc struck from O as center with a radius equal to d-7 in the true lengths. Now with O-1 in the side elevation as radius and O in the pattern as center describe a short arc near 1 and intersect it by an arc struck from 7 as center with a radius equal to a-7 in the true lengths. Proceed in this manner using, alternately, the proper numbered division taken from the center curve in side elevation, then the proper numbered true length of the dotted line in the diagram of true lengths; the proper numbered division along the heel in side elevation, then the proper numbered true length of the solid line, until the line 4-4" in the pattern is drawn, which is obtained from 4-4" in plan. Trace a line through intersections in the pattern, then O-4"-8-O will be the desired heel pattern. Allow laps and edges for seaming or riveting.

HOMER

FURNACE & FOUNDRY CORPORATION

MANUFACTURERS OF FURNACE AND BOILER REPAIR PARTS



Attractive prices
to volume buyers
PLUS free delivery
by Homer's
own fleet of fast
trucks.

FOR CATALOG
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INFORMATION,
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HOMER FURNACE & FOUNDRY CORP.
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AIR-VANE FORCED AIR REGISTERS



Made By
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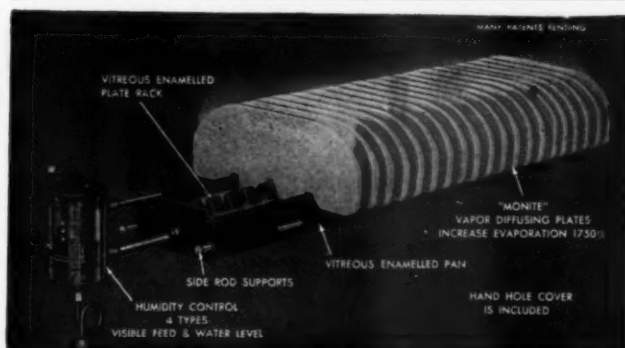
No. 802 AIR-VANE Forced Air Register

Quality of equipment is essential to the performance and life of any modern forced warm air heating installation. You'll find that Rock Island's AIR-VANE Line will fill the bill for you on the most exacting jobs. They're constructed with vertical or horizontal vanes for right or left or downward deflection of air flow. Multi louvre dampers for standard and 15 degrees downward directional air flow are standard. This versatile model is also available with single louvre in wall or baseboard registers.

Check the complete Rock Island line ... if it's a Rock Island Register you KNOW it's good.

ROCK ISLAND REGISTER CO.
ROCK ISLAND, ILL.

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MONMOUTH HUMIDIFIERS

For healthful operation, every heating system, new or old, requires a dependable humidifier. In Monmouth, superb engineering and careful craftsmanship assure the finest device available. We make a complete line of humidifiers for all your needs:

- **FLOTROL** Humidifiers for warm air or air conditioning.
- **MICRO-FEED**—the simple, low-cost control for drip feed operation.
- **Monmouth HUMIDITY CONDITIONER**, gas-operated, for all radiator heated buildings.

The trivial extra cost for a genuine Monmouth, over that of inferior equipment, is more than made up in savings on service and repair charges. Thousands of satisfied users, hundreds of enthusiastic dealers. Get that **EXTRA** profit from the easy sale of Monmouth Humidifiers on your job! Available for delivery now.

Descriptive bulletin and prices, also free handy humidity computation guide, sent on request.

**THE CLEVELAND
HUMIDIFIER CO.**

7802 Wade Park Ave.

Cleveland 3, Ohio

Super Red Streak Time Is Here Again—

Time for Spring Cleaning. And time for you to clean up too. Do both with a Super Red Streak Furnace Cleaner by removing record-breaking Winter's accumulation of dirt and soot in heating plants and chimneys, and uncovering the biggest market of all time for repairs and replacements.



Housewives want this job done before they start their Spring house cleaning. The Super way is clean and quick—no disrupting the household—no mess. Try a Super 5 days free. Keep all it makes for you. Write for data.

National Super Service Company, Inc.

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To Your SPECIFICATIONS

All sizes—accurately rolled to any diameter—complete circles or any part thereof—made in every dimension, furnished with or without bolt or rivet holes.

You'll appreciate this when you back them up or fit them on the job.

Used for reinforcing tanks, joining pipe or smoke stacks, installing air conditioning fans, and thousands of other uses.

"FABRICATING to customers' specifications and prints" has enabled us to accumulate a large stock of punches and dies for piercing, blanking, notching and forming—available to you. Send us your fabricating requirements.

Write for our circular illustrating the scope of our service.

NATIONAL METAL FABRICATORS

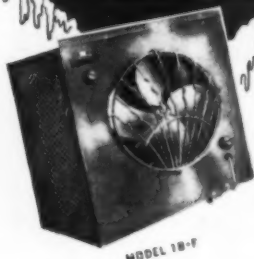
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Cooling Assures COOL
REFRESHING COMFORT

GREATER DEALER PROFITS



Universal Coolers are built for easy installation — years of trouble-free operation.

Maximum cooling efficiency assured. By turning off the water to the cooler on humid days, cooler becomes a very efficient ventilating system.

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ORDER ONE TODAY
PROFITS WILL START
IMMEDIATELY

DISTRIBUTORS—
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BUY THE BEST . . . BUY A REED ALL STEEL BENDING ROLL



Here, for both production and job shops is the answer to light gauge rolling jobs. Made in five sizes, from 36" x 10 ga. to 72" x 16 ga.

- ★ ALL STEEL
- ★ COMPACT
- ★ BRONZE BEARINGS
- ★ ENCLOSED BEARINGS
- ★ LOW IN COST

Available for prompt delivery, and we do mean **PROMPT**

REED ENGINEERING COMPANY

ENGINEERS AND MANUFACTURERS
CARTHAGE, MISSOURI U.S.A.

Concrete Floors

(From page 91)

parts of coarse aggregate well graded in size from $\frac{1}{4}$ in. up to 1 in. It should be a plastic mix which can be placed without honeycombing or developing excess water on the surface. If necessary, the proportion of fine and coarse aggregate should be adjusted to obtain a mix of desired workability. The concrete after placing should be thoroughly compacted by vibrating or by tamping and spading after which it should be screeded to proper grade. The subsequent steps in finishing the concrete surface will depend upon finish specified.

For an even true surface, the concrete, after being struck-off to proper grade, should be worked with a wood float in a manner which will compact the surface and leave no depressions or inequalities of any kind. After the concrete has hardened sufficiently to prevent fine material from working to the top (when the sheen or shiny film of water on the surface has disappeared) it should be steel-troweled, but excessive troweling should be avoided.

The concrete should be kept moist for at least 2 days except when the finished floor is to be exposed concrete. In this case at least 5 days of moist curing will be required. Moist burlap or canvas or a waterproof concrete curing paper may be used to cover the floor slab during this curing period. Curing should begin as soon as the concrete has hardened sufficiently to prevent damage, and if burlap or canvas is used, it should be sprinkled at sufficient intervals to keep it wet.

Metal reinforcement weighing not less than 40 lb. per 100 sq. ft. with equal cross-sectional area of the

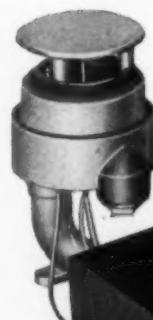
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A REAL *Time Saver*



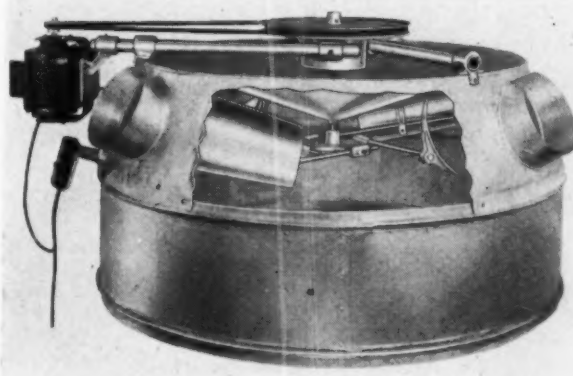
The No. 4B PUNCH by *Whitney*

This punch is accepted by leading contractors and dealers as a real time-saver in the shop and on the job. Men who use it every day know it can't be beat for clean, fast punching. Has a capacity of $\frac{1}{4}$ " through 16 ga., weight 3 pounds, $8\frac{1}{2}$ " in length, depth of throat, 2". Complete tool includes three punches and three dies of specified sizes with die adjusting key.



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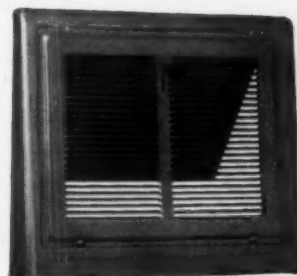


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SPECIFICATIONS:

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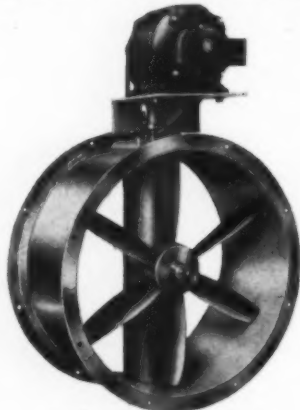
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reinforcement in both directions should be placed in the concrete slab 1½ in. from the top surface.

Insulation

A 1-in. thick, continuous, waterproofed rigid insulation strip should be provided between the foundation walls and the edge of the floor slab. Recent studies by the National Bureau of Standards have indicated that this edge insulation is highly important. The granular fill and membrane damp-proofing under the floor slab act as an insulating material and in most cases have sufficiently reduced the heat loss to the subgrade.

Floor Finishes

Terrazzo, concrete tile, ceramic tile, asphalt tile, and wood flooring are the coverings most widely used for concrete floors on ground. Where other types of floor covering are contemplated, it is recommended that the manufacturer's advice be obtained as to their suitability and the methods of application.

Some concrete floors are troweled smooth in their natural color and may be given a linseed oil treatment or waxed and polished.

Color can be added to concrete floors by incorporating pure mineral oxide pigments as the concrete is placed. After the concrete has hardened and dried the colored surface should be waxed and buffed. Color can also be produced by using commercial stains guaranteed by the manufacturer to produce satisfactory results. The stains can generally be obtained from local paint or hardware dealers and should be applied in accordance with the manufacturer's recommendations.

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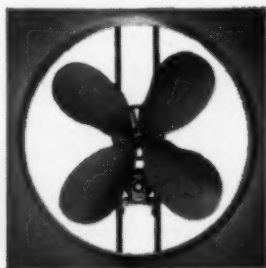
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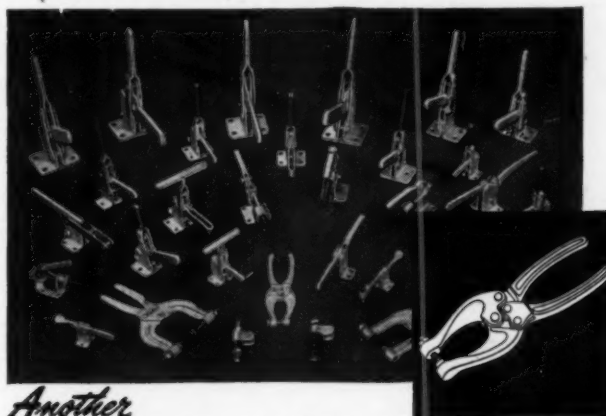
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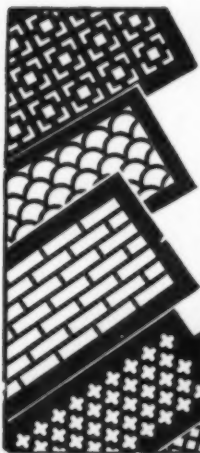
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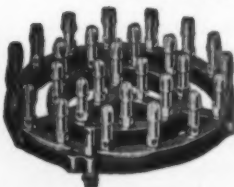
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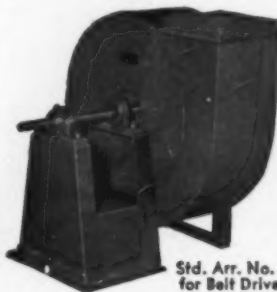
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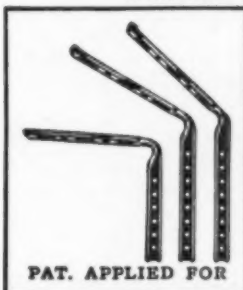
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(From page 102)

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The total exhaust air capacity of the spray process is 54,000 cfm which is replaced by 48,000 cfm of tempered outside air supplied to the space through units similar to those described for the plating room. A negative pressure is maintained in the spray room area also, by exhaust and supply air balance, which prevents exfiltration of air to other parts of the building.

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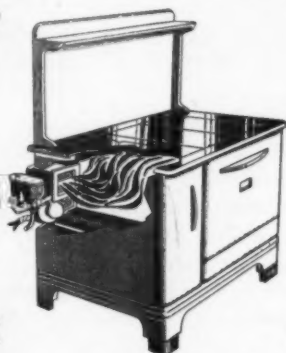
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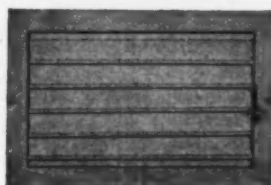
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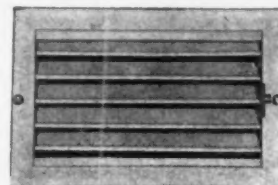
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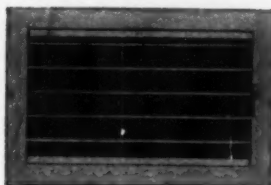
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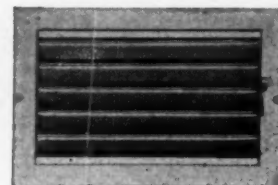
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Editorial

Labor Management Relations Act

(From page 69)

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Second, the union shop agreement is permitted only where authorized by a majority of the employees eligible to vote in the bargaining unit affected, and discrimination is permitted under such an agreement only

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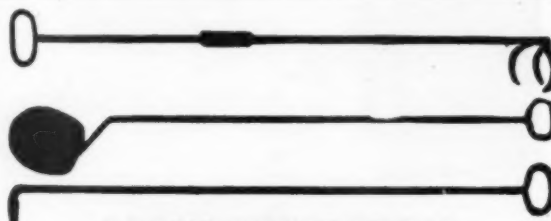


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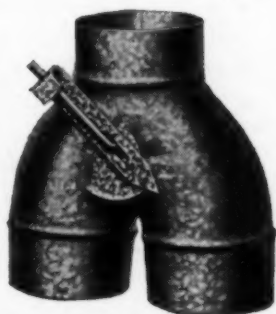
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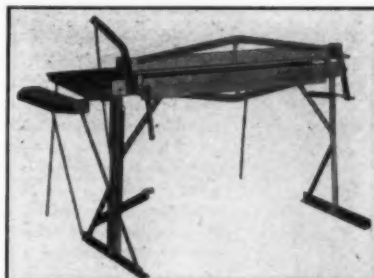
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Editorial

Labor Management Relations Act

(From page 69)

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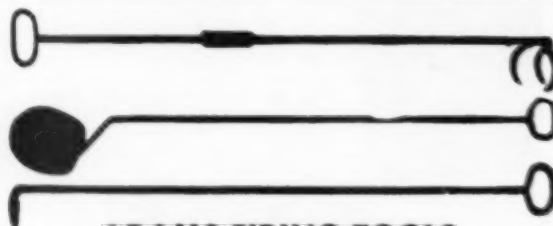
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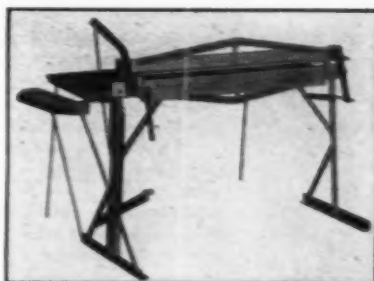
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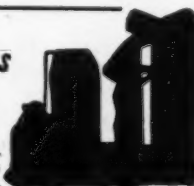
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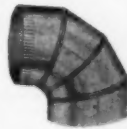


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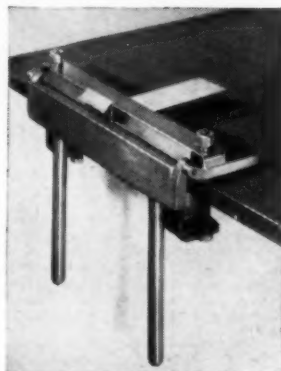
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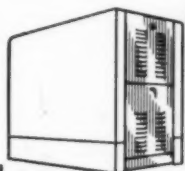
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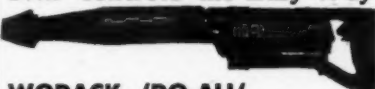
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Index to ADVERTISERS

Accurate Sheet Metal Mfg. Wks. *	Fried Air-Kool Co. 148	Peerless Foundry Co. 166
Acme Electric Welder Co. 190	Front Rank Furnace Co. *	Peerless Sales & Supply 195
Acme Equipment Company *	G & S Machine Shop 104	Penn Electric Switch Co. 135
Adams Co., The 190	Gallaher Co. 191	Penn Ventilating Co. 187
Aerofin Corp. *	Galvan Mfg. Co. 191	Perfex Corp. 139
Air Conditioning Products Co. 170	General Blower Co. *	Permanente Metals Corp. *
Air Controls, Inc. 165	General Controls 19	Petroleum Heat & Power Co. 129
Air Controls Products, Inc. 27	General Elec. Corp. 51 & 160	Pioneer Tool Co. 195
Airtemp Div. of Chrysler Corp. 132	General Filters, Inc. 181	Potts-Farrington Co. 194
Airtherm Mfg. Co. *	Gerett Corp., M. A. 174	Premier Furnace Co. 23
A-J Mfg. Co. *	Gilbert & Barker Mfg. Co. *	Prole & Coogan Heating Co. *
Ajax Furnace Fitting Co. 186	Gilcor Products Corp. 190	Quaker Mfg. Co. *
All-Gas Equipment Co. *	Gillen Co., J. L. 191	Randall Graphite Bearings, Inc. 149
Allen Co., Inc., L. B. 190	Goergen-Mackwirth Co., Inc. *	Raytheon Mfg. Co. *
Alton Mfg. Co. 177	Grand Rapids Die & Tool Co. *	Reed Engrg. Co. 184
American Brass Co. 134	Gray, G. L. *	Register & Grille Mfg. Co., Inc. 189
American Machine Products *	Great Nat'l Air Cond. Corp. 172	Reiner & Campbell Co., Inc. *
American Metal Products Co. 189	Hall-Neal Furnace Co. 67	Reinhard Bros. Co. 184
American Radiator & Standard Sanitary Corp. 13	Harrington & King Perforating Co. 178	Republic Steel Corp. 16
American Rolling Mill Co., The 20	Harris, A. H. 191	Research Products Corp. Outside Back Cover
American Smelting & Refining Co. *	Harris & Cooley Mfg. Co. 21	Revere Copper & Brass, Inc. 113
Anchor Post Products, Inc. 32 & 33	Harvey-Whipple, Inc. *	Reynolds Metals Co. 49
Anchor Div. Stratton - Terstegge Co. 178	Hasko Utilities Co. *	Richmond Radiator Co. 17
Anemostat Corp. of America *	Heating Specialties Company *	Riverside Machinery Company 167
Anthraxite Institute 127	Hell Co. *	Rock Island Register Co. 183
Armstrong Co., The 168	Henry Furnace Co., The 43	Rotex Punch Co. 179
Audel & Co. 193	Hess Warming & Ventilating Co. *	Round Oak Co. *
Auer Register Co. 66 & 188	Hexdall Co., A. M. 181	Rudy Furnace Co. *
Automatic Burner Corp. 155	Homer Furnace & Foundry Corp. 182	Rybolt Heater Co. 48
Automatic Furnace Co. *	Hotstream Heater Co. *	Ryerson & Son, Inc., Joseph T. 68
Automatic Humidifier Co. 65	Howell Oil Burner Co., H. A. *	Sampsel Time Control Co. 166
Automatic Products Co. *	Huasey & Co., C. G. *	San Angelo Fdry. & Machine Co. 168
Bacharach Industrial Instrument Co. 194	Ilg Elec. Vent. Co. *	Schaefer Brush Mfg. Co. *
Barber Colman Co. *	Illinois Bronze Powder Co. 191	Schwab Furnace Co. *
Barber Gas Burner Co., The 188	Illinois Testing Laboratories Inc. 53	Schwitzer-Cummins Co. 130
Bard Mfg. Co. 151	Independent Pneumatic Tool Co. 64	Sciaky Bros. 173
Barth Mfg. Co. 170	Independent Register Co. 171	Scully Signal Co. 153
Bauer & Black, Div. Kendall Co. 140	Inland Steel Products Co. 98	Sequoia Mfg. Co. 189
Bayley Blower Co. 188	Interstate Machinery Co. 195	Signal Electric Mfg. Co. *
Berger Bros. Co. 188	Jack & Heintz Precision Industries, Inc. 15	Skilaw, Inc. *
Berger Mfg. Co., Div. of Republic Steel Corp. 42	Johnson Gas Appliance Co. *	Skuttle Mfg. Co. 173
Bethlehem Steel Co. 62	Juniper Elbow Co., Inc. 193	Smith & Son, Inc., Seymour *
Beverly Shear Co. 172	Kalamazoo Stove & Furnace Co. *	Smith, R. E. 194
Bishop & Babcock 178	Kirk & Blum Mfg. Co. *	Standard Heating Equip. Co. 174
Black & Decker Mfg. Co. 163	Koppers Co. 171	Standard Stamping & Perforating Co. 185
Black, Sivals & Bryson 163	Kresky Mfg. Co. 38	Stefco Steel Co. 55
Bone Tool & Gauge Company *	Kresno Stamm Mfg. Co. *	Stewart Mfg. Co. *
Brauer Supply Mfg. Co., A. G. 188	Krueger Sentry Gauge Co. 8	Sundstrand Engrg. Co. 192
Breese Burners, Inc. *	Lakewood Engr. Co. 14	Superior Products Co. *
Brenner Co., Jacob *	Lau Blower Co. *	Surface Combustion Corp. 131
Brooks Co., Inc., B. D. 195	Libert Machine Co. *	Swartwout Co. 175
Brundage Co. 146	Lockformer Co. 9	Synchromatic Corp. 5
Bryant Heater Co. 52	Made-Rite Furnace Pipe & Fitting Co. 161	Tennessee Coal, Iron & R. R. Co. 152
Buffalo Forge Co. 56	Mald-O'-Mst, Inc. 179	Thatcher Furnace Co. 29
Cady Co., The 30	Majestic Co. 182	Therm Oil Burner Co. 189
Carnegie-Illinois Steel Corp. 152	Maplewood Machinery Co. 182	Thor Metal Prod. Co. *
Century Engrg. Corp. 147	Marshalltown Mfg. Co. *	Thor Tool & Die Co. 193
Certified Furnace Co. 161	Maurey Mfg. Co. *	Tinit Mfg. Co. 192
Char-Gale Mfg. Co. 58	May-Flebeiger Co. 180	Tjernlund Mfg. Co. 169
Chase Brass & Copper Co. 176	Mayflower Air Conditioners, Inc. *	Top Flight Tool Co. 193
Cheney Flashing Co. 188	McDonnell & Miller, Inc. 41	Trade Winds Motor Fans, Inc. *
Chevrolet Motor Div., General Motors Corp. 34	Mercoid Corp., The 6	Triangle Mfg. Co. 169
Chicago Metal Mfg. Co. 159	Meyer & Bro. Co., F. 136	Turnbull Mfg. & Dist. Co. 179
Clarage Fan Co. *	Meyer Furnace Co. 7	Turner Brass Works *
Clayton & Lambert Mfg. Co. *	Mideo Register Corp. 181	Tuttle & Bailey, Inc. 50
Co. Inside Front Cover	Mideo Mfg. Co. 192	Union Mfg. Co. *
Clean Sweep Co., The 192	Miller & Doring 192	U. S. Air Conditioning Corp. 3
Cleveland Humidifier Co. 183	Milton Equipment Co. 187	U. S. Machine Corp. 45
Cole-Sewell Engineering Co. *	Minneapolis-Honeywell Regulator Co. 24 & 25	United States Register Company 159
Columbia Steel Co. 152	Modern Furnace & Dev. Co. *	United States Steel Corp. 152
Comfort Products Corp. 46	Morrison Products, Inc. *	United States Steel Export Co. 152
Conco Engineering Works *	Morrison Railway Supply Corp. 31	United States Steel Supply Co. 152
Condensation Engineering Corp. 12	Morrison Steel Products, Inc. 191	Utility Appliance Corp. *
Connor Engr. Co., W. B. 163	Mt. Vernon Furnace & Mfg. Co. 40	Universal Air Conditioning Co. 184
Corlett-Turner Co. 185	Mueller Furnace Co., L. J. 133	Verson Allsteel Press Co. 150
Coronaire Heater Corp. *	Murray Co., The 187	Viking Air Conditioning Corp. 156 & 157
Cotta Transmission Corp. 180	National Engr. & Mfg. Co. 162 & 181	Viking Mfg. Co. *
Crescent Tool Co. 60	National Gas Equipment Co., Inc. 187	Wagner Elec. Corp. 175
Crest Inds. *	National Heater Co. *	Ward Machinery Co. 192
Crisae Elec. Mfg. Co. *	National Metal Fabricators 183	Waterman-Waterbury Co. 80
Dahlstrom Machine Works 190	Nelson Corp., Herman 154	Webster Electric Co. *
Damascus Steel Products Corp. 191	National Super Service Co. 183	Weirton Steel Co. 35
Dana Fan & Blower Co. 186	Niagara Furnace Div. of the Forest City Foundries Co. 44	Wells Mfg. Co. *
Delco Products Div., General Motors Corp. *	Niagara Machine & Tool Works 36	Western Engrg. Co. 28
Des Moines Stove Repair Co. 180	Norge-Heat Div., Borg-Warner Corp. 143	Westinghouse Electric Corp. *
Detroit Air Filter Co. 186	Northwest Metal Products, Inc. 145	Wheeling Corrugating Co. 61
Detroit Lubricator Co. *	Nu-Way Corp. *	White Mfg. Co. 11
Detroit Stamping Co. 187	Ohio Electric Mfg. Co. *	White-Rodgers Elec. Co. *
Dole Valve Co. 57	Oil Heat Institute of America *	Whitney Mfg. Co., W. A. 185
Doyle Vacuum Cleaner Co. 176 & 193	Olsen Mfg. Co., C. A. 26	Whitney Metal Tool Co. 179
Dravo Corp. 54	Omaha Stove Repair Works 192	Williams Oil-O-Matic Division. *
Dreis & Krump Mfg. Co. 190	Owens-Corning Fiberglass Corp. 37	Eureka Williams Corp. *
Dresser Industries (See Bryant Heater Co.) *	Pacific Industrial Mfg. Co. 22	Williams-Wallace Co. *
Eckhart Mfg. Co. 137	Packard Elec. Div., General Motors Corp. 63	Williamson Heater Co. *
Elgo Shutter & Mfg. Co. *	Palmer Mfg. Co. 165	Wilson & Co., Inc. *
Enderle, Inc., Ltd., Frank X. 190	Paragon Elec. Co. 18	Wilson, Inc., Grant 144
Fairbanks-Morse Co. *	Parker-Kalon Corp. 10	Wilson, K. R. 47
Feld Control Div., H. D. Conkey & Co. 59	Patten Co., J. V. 10	Wisconsin Furnace Co. *
Fitzgibbons Boiler Co., Inc. 141	Peck, Stow & Wilcox Co. 164	Wise Furnace Co. *
Follansbee Steel Corp. 177	Peerless Elec. Co. 142	Wodack Electric Tool Co. 195
Forest City Foundries Co., Inc. 44		Wolff & Co., Benjamin Inside Back Cover
Frayn Co. 195		Wysonog & Miles Co. 39
		XXth Century Htg. & Vent. Co. 167
		Youngstown Furnace Co. 185
		Zink, John Co. 158

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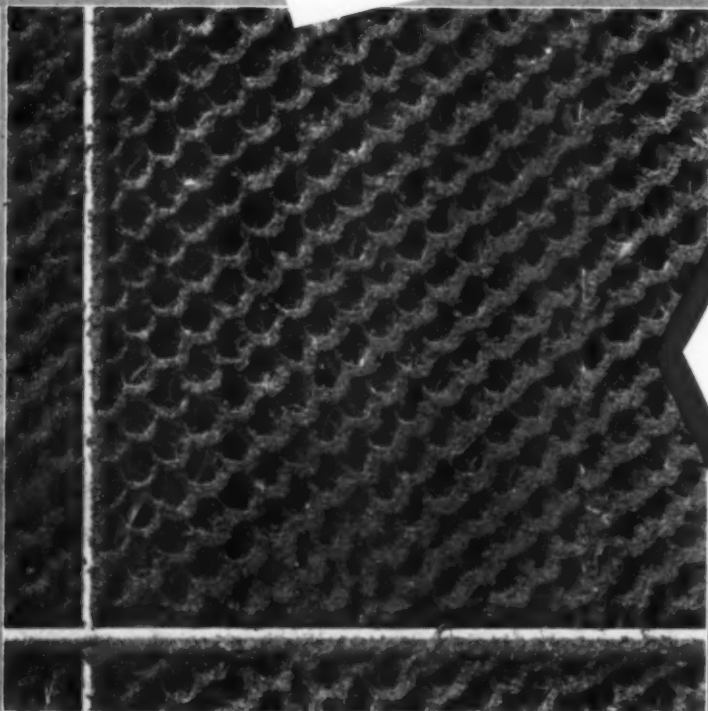


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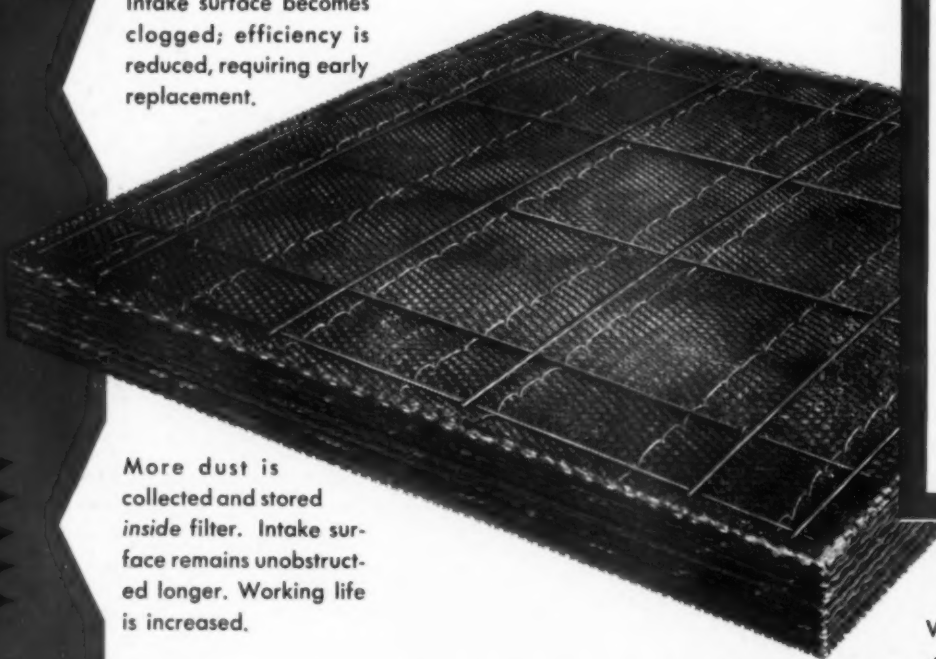
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